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SELECTED MARKETING TOPICS RELATING TO COTTON AND OILCROPS

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ECONOMIC RESEARCH SERVICE

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PREFACE

This publication is a collection of selected articles dealing with current marketing topics relating to cotton and oilcrops. The purpose of these reprints is to provide, under one cover, a readily available source of marketing information. These special articles originally appeared in various issues of the Cotton and Wool Situation and the Fats and Oils Situation which are published five and four times a year respectively by the Fibers and Oils Program Area, Commodity Economics Division. The Fibers and Oils Program Area conducts a broad range of research activities covering each segment of the production-marketing system for cotton and oilcrops in addition to providing current situation and outlook intelligence for cotton, wool, mohair, and fats and oils.

Further information or additional copies of this publication can be obtained from Fibers and Oils Program Area, Commodity Economics Division, Economic Research Service, U. S. Department of Agriculture, 500 12th St., S.W., Washington, D. C. 20250. Telephone 202-447-8400.

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DISTRIBUTION OF AN AVERAGE BALE OF U.S. COTTON

by
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Economic Research Service

ABSTRACT: Detailed estimates of the physical distribution of an average bale of U.S. cotton are presented. These data show the relative amount of cotton used in various end uses, and volumes passing through alternative processes. Results show that only about 41 percent of a 500-pound gross weight bale of cotton is used in clothing, 30 percent in household goods, and 13 percent in industrial uses. Waste and tare account for 16 percent.

KEYWORDS: Cotton, distribution, marketing

The typical bale of United States cotton travels many diverse paths from the time it's produced until the bale is ultimately consumed in thousands of end uses. Throughout the production-consumption process, numerous complex operations and services are required to turn the raw fiber into a useable product. And, at each stage, additional costs are incurred which contribute to the overall value of textile products. In fact, the raw fiber usually accounts for an average of only about 10 percent of the final value of the product. This varies, however, depending on the type of processing and product involved and the number of stages through which the fiber passes.

The purpose of this article is to provide estimates of the distribution of an average bale of cotton by type of processing and end use market. This information is useful for identifying shifts in the relative importance among textile markets and for providing a deeper insight into the total cotton production-consumption system. Moreover, when combined with operating costs and othestal¾s information can be used to help assess the impacts of various events or actions on the major sectors of the textile industry.

The physical distribution of a bale of U.S. cotton from the time it is delivered to the textile mill door until it has been consumed in its final uses is shown in figure 8. Data used to develop these estimates were primarily obtained from the U.S. Bureau of the Census and the National Cotton Council of America and are for 1974, the latest year for which complete data are available.

RAW FIBER

Upon delivery to the textile mill, a bale of raw cotton averages about 500 pounds. Of this total, approximately 20 pounds or 4 percent is jute bagging and metal ties or bands ("tare"). However, an increasing volume of cotton is being wrapped with new improved materials which may weigh as little as 7 pounds. The remaining 480 pounds of cotton contains an average of 24 pounds of non-lint waste such as dust and vegetable matter. An additional 29 pounds of useable waste is produced in the first stages of the yarn production process. This useable waste is sold to the textile waste industry which uses it primarily for padding and upholstery filling.

YARN PRODUCTION

On the average, a net weight of 427 pounds or slightly over 85 percent of the original bale is manufactured into yarns. About 76 pounds is used to produce knit goods, 9 pounds is made into sewing thread; carpet and tufting yarns account for 3 pounds, and about 7 pounds is used in other types

[1]Economist and Statistical Assistant respectively, Fibers Program, Washington, D.C.

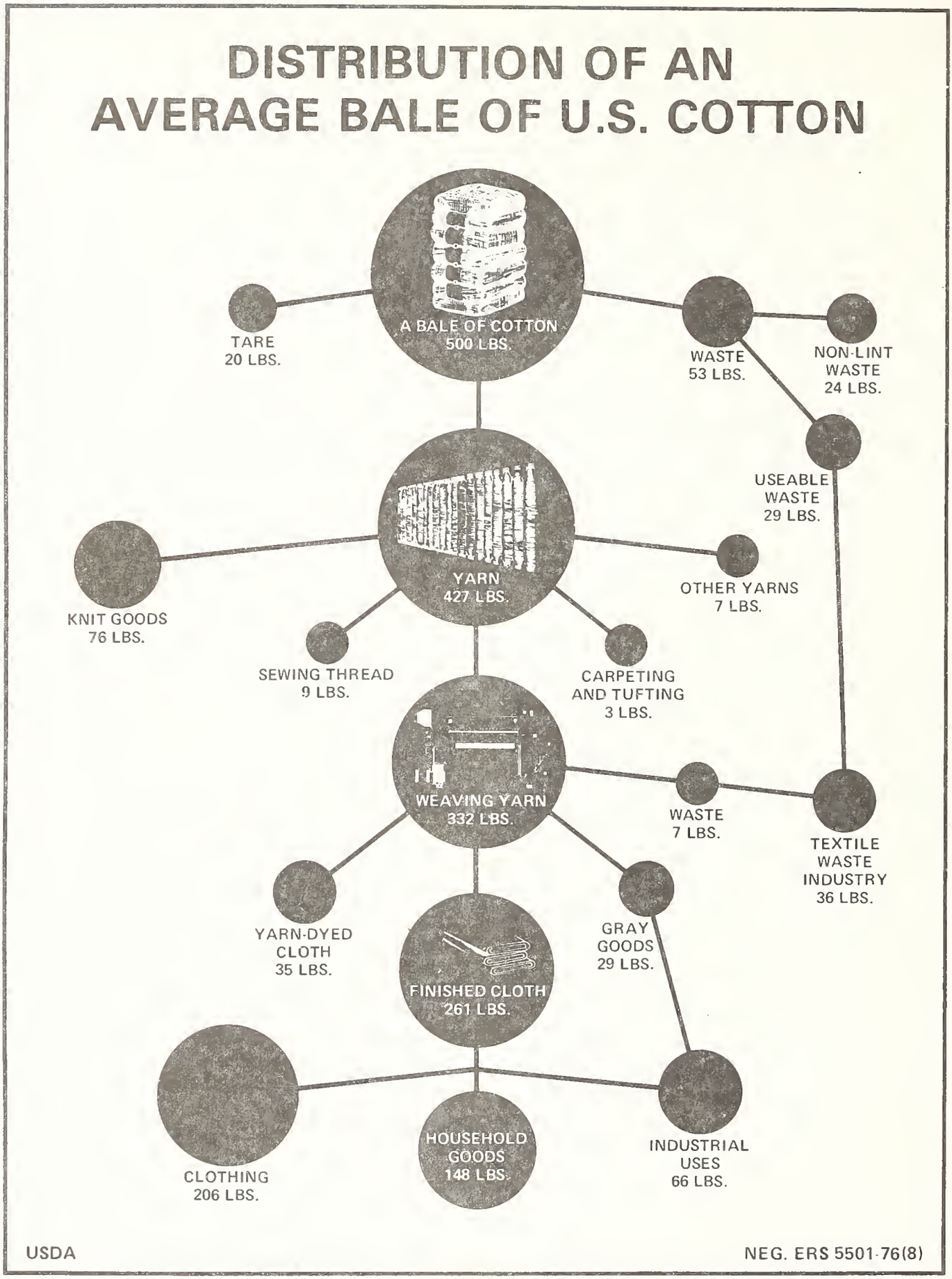
DISTRIBUTION OF AN AVERAGE BALE OF U.S. COTTON
A BALE OF COTTON
500 LBS.
TARE
20 LBS.
WASTE
53 LBS.
NON-LINT
WASTE
24 LBS.
USEABLE
WASTE
29 LBS.
YARN
427 LBS.
KNIT GOODS
76 LBS.
OTHER YARNS
7 LBS.
SEWING THREAD
9 LBS.
CARPETING
AND TUFTING
3 LBS.
WEAVING YARN
332 LBS.
WASTE
7 LBS.
TEXTILE
WASTE
INDUSTRY
36 LBS.
YARN-DYED
CLOTH
35 LBS.
GRAY
GOODS
29 LBS.
FINISHED CLOTH
261 LBS.
CLOTHING
206 LBS.
HOUSEHOLD
GOODS
148 LBS.
INDUSTRIAL
USES
66 LBS.
USDA
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Figure 8

of speciality yarns. The largest share of total yarn production—332 pounds or nearly 78 percent—is woven into fabric.

FABRIC PRODUCTION

Finished cloth (bleached, dyed, printed) is the primary outlet for cotton fiber with approximately 261 pounds or more than one-half of the original bale consumed in this use. Unfinished or gray goods, which are raw unbleached fabrics, account for 29 pounds and are used primarily for industrial applications. Nearly 35 pounds or 11 percent of all weaving yarn is used to produce yarn-dyed fabrics where yarn is first dyed and then woven. Most cotton denim products are constructed from yarn-dyed fabric and account for a growing share of total cotton utilization. However, during the process of converting yarn to a woven fabric, approximately 2 percent or 7 pounds of waste results which is also sold to the textile waste industry.

END USES

Except for waste and tare, all of the original bale of cotton ends up in three major end use categories—apparel, household, and industrial. Products range from shirts to sheets to fire hoses. Clothing accounts for about 206 pounds or 50 percent of total end use. The manufacture of household goods consumes 148 pounds while industrial uses account for about 66 pounds. In addition, the estimated 36 pounds of useable textile waste is indirectly utilized in both household and industrial products.

CHANGES IN THE U.S. COTTON STORAGE INDUSTRY

by
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ABSTRACT: Increasing input costs and declining volumes of cotton available for storage have been primarily responsible for a steep decline in the number of commercial storage facilities and total storage capacity for cotton. The greatest contraction has been in the Southeast. Only the Western area has experienced an increase in storage capacity, and yet, it is also the only area not faced with a significant overcapacity problem. New high capacity gins, ginning-warehousing complexes, acceptance of universal density bales and forward contracting will further impinge upon the public storage segment of the cotton industry.

KEYWORDS: Cotton, warehouse, compress, storage capacity, increasing cost industry.

The commercial cotton storage industry is vital to the marketing of American cotton.[1] Since only a small amount of cotton has historically moved directly from gins to textile mills, vast amounts of commercial storage space have been needed to assemble cotton for domestic use or export. But the lower stocks of cotton in recent years have resulted in a rapid increase in surplus storage space, and many plants have closed because of declining revenue. Several recent developments point to a continuation of this trend.

STORAGE CAPACITY AND UTILIZATION

Total U.S. commercial cotton storage capacity remained unchanged at 15.5 million bales from 1945 to 1950. However, as production reached near-record levels, the demand for storage space increased dramatically. Between 1950 and 1964, commercial capacity increased to 26.4 million bales, but by 1970 capacity had fallen to 24 million and has since declined to the present level of 18.1 million (table 19). While a considerable portion of this lost storage space possibly could again become

Table 19—Commercial cotton storage capacity and utilization, United States, 1945-75

Year beginning August 1	Total capacity	Average inventory[1]	Government controlled		Capacity utilization[2]
	Million bales	*Million bales*	*Mil. bl.*	*Pct.*	*Percent*
1945	15.5	8.2	6.9	84.1	52.9
1950	15.5	4.1	3.5	85.4	26.5
1955	18.7	14.5	8.1	55.9	77.5
1960	22.4	8.4	5.0	59.5	37.5
1965	25.2	16.4	11.6	70.7	65.1
1966	24.8	14.2	12.2	85.9	57.3
1967	24.5	12.7	5.8	45.7	51.8
1968	24.0	8.4	.1	1.2	35.0
1969	24.7	7.0	2.9	41.4	28.3
1970	24.0	6.6	3.0	45.5	27.5
1971	21.9	5.4	.3	5.6	24.7
1972	20.5	4.1	.3	7.3	20.0
1973	20.2	5.5	.2	3.6	27.2
1974	18.1	4.7	.2	4.3	26.0
1975	18.1	5.4	.9	16.7	29.8

[1] Average of monthly ending inventories. [2] Average inventory divided by total capacity.

[1]There are two types of storage facilities, compresses and warehouses. Compresses are facilities equipped with machinery capable of changing the size and density of gin-run bales. Warehouses are facilities capable of handling and storage functions only.

available for cotton, much of it has either been converted for other goods or has become obsolete.

A continuing problem with the cotton industry has been underutilization of storage capacity. Only 11 times since 1945 has storage capacity utilization exceeded 50 percent. Storage utilization peaked in 1955 at 77.5 percent. Since then, average inventory has declined and during 1971-75 was the lowest on record.

Cotton held under government loan programs has generally occupied much of the commercial storage space across the Cotton Belt. During 1953-70, cotton held under nonrecourse loans accounted for 50 percent or more of storage facility inventories. The proportion of cotton stored under the various programs ranged from virtually zero in 1948 to 86 percent in 1966. As production declined, stocks of government-held cotton dropped to 4 percent in 1973 and 1974 but increased to 17 percent in 1975.

NUMBER, LOCATION, AND CAPACITY OF FACILITIES

There were 1,166 compress and warehouse installations approved to handle and store government-controlled cotton in 1965 (table 20). By 1971, CCC stocks were down 97 percent and production was down 31 percent from the 14.9-million-bale crop of 1965. Concurrently, the number of facilities available for cotton storage also declined, and by 1971 total facilities numbered 759, a decline of over one-third. This decline implies increasing average costs for the industry. And the situation has not changed since 1971 as plant numbers continued to decline. Only 563 facilities were active in the Cotton Belt in 1975.

Although the total number of plants has decreased 52 percent since 1965, total capacity has declined only 28 percent.

The impact of declining volume on the commercial storage industry has been greatest in the Southeast as cotton acreage shifted to other crops and regions. From 1965 to 1975, the total number of active compresses and warehouses in this area decreased 61 percent and storage space dropped from 6.3 to 3.2 million bales. Nearly all of this decrease was in the warehouse sector. Moreover, 81 percent of all warehouses operating in 1975 were in the Southeast. These 295 facilities accounted for 64 percent of total U.S. warehouse capacity.

The South Central area accounted for nearly two-fifths of total U.S. cotton storage space in 1975. Compress numbers have remained relatively stable since 1965; however, capacity has decreased by 1.2 million bales. Present compress capacity is 6.3 million bales. The number of warehouses is down from 63 to 28 and warehouse capacity has decreased to 579,000 bales. In this area, which produces nearly one-third of the U.S. cotton, storage capacity greatly exceeds normal requirements.

The Southwest, which produces about one-third of the total crop, provides about 25 percent of the total storage space. Total capacity in the Southwest exceeds normal requirements by 50 percent; however, capacity has declined only slightly since 1965 while the number of plants in operation has decreased considerably.

Storage facilities in the West are generally large; therefore, despite the small number of plants (28), this area accounted for 12 percent of the Cotton Belt's 1975 capacity. The West's share of total storage space was only 7 percent in 1965. Unlike other areas in the Cotton Belt, very little excess capacity exists in the West during the harvest season. In fact, this is the only area where total production exceeds total storage space. However, due to the seasonal inflow and outflow of stocks, storage capacity has been adequate.

Port facilities are unique since they do not compete to an appreciable degree with other types of storage facilities. Ports function primarily as concentration points for cotton destined for export. As foreign demand leveled off between 1965 and 1975, the total number of active port compresses declined and only 11 were active in 1975. Consequently, both total capacity and the number of facilities have dropped about 65 percent.

AREA UTILIZATION AND PLANT SIZE

Storage capacity, average inventory, and capacity utilization by area are given in table 21 for 1965-75. Capacity utilization in the various regions has trended down sharply since 1965. However, these percentages leveled off in the early 1970's and by 1975, were considerably above 1970-74 averages in the Southeast and West, where the percentage utilization of storage space is generally greatest. Capacity utilization in the South Central and Southwest areas has remained relatively stable during the last few years.

The utilization percentage of Southwest storage space is somewhat biased upwards. This results from the fact that most port facilities are located in this area and inventories of these facilities are included in this area's average inventory, but the capacities of these ports are not.[2] However,

[2]Data were not available to allow for the yearly inclusion of port capacity by region. Available data indicate the percentages are biased upward by 10 and 4 percent, respectively, for 1965 and 1975.

Table 20—Cotton warehouses and compresses: Number, capacity, and size group by area, crop years, 1965, 1971 and 1975[1]

Area and bale capacity group	Number of plants			Capacity of plants		
	1965	1971	1975	1965	1971	1975
	Number	*Number*	*Number*	*1,000 bales*	*1,000 bales*	*1,000 bales*
Warehouses[2]						
Southeast:[3]						
5,000 or less	400	207	113	1,077.7	582.8	326.0
5,001-15,000	264	169	146	2,223.4	1,473.8	1,259.8
15,001-25,000	57	23	16	1,077.4	454.5	328.2
25,001-50,000	31	22	14	952.0	696.9	459.1
50,001 or greater	6	8	6	395.7	563.2	469.4
Total	758	429	295	5,726.4	3,771.2	2,842.5
South Central:[4]						
5,000 or less	8	4	1	23.9	14.8	3.8
5,001-15,000	35	19	20	364.2	191.6	231.7
15,001-25,000	11	7	5	180.7	145.0	105.0
25,001-50,000	8	7	1	247.5	217.6	29.7
50,001 or greater	1	1	1	291.3	324.5	208.6
Total	63	38	28	1,107.6	893.5	578.8
Southwest:[5]						
5,000 or less	19	10	2	56.2	32.6	6.0
5,001-15,000	38	23	13	390.6	241.0	138.3
15,001-25,000	16	17	10	319.1	368.8	204.2
25,001-50,000	7	10	8	254.3	328.6	276.1
50,001 or greater	0	2	2	0.0	159.0	180.0
Total	80	62	35	1,020.2	1,130.0	804.6
West:[6]						
5,000 or less	2	2	1	15.0	5.0	5.0
5,001-15,000	0	2	3	0.0	20.5	27.5
15,001-25,000	0	0	1	0.0	0.0	22.5
25,001-50,000	0	0	2	0.0	0.0	80.0
50,001 or greater	0	0	1	0.0	0.0	64.0
Total	2	4	8	15.0	25.5	199.0
Total warehouses	903	533	366	7,869.2	5,820.2	4,424.9
Compresses[7]						
Southeast:[3]						
50,000 or less	5	2	2	158.6	77.5	77.5
50,001-100,000	5	7	5	308.5	466.4	303.4
100,001 or greater	1	0	0	103.0	0.0	0.0
Total	11	9	7	570.1	543.9	380.9
South Central:[4]						
50,000 or less	51	50	55	1,875.3	1,850.5	1,980.8
50,001-100,000	49	45	34	3,424.3	3,132.1	2,388.7
100,001 or greater	12	14	13	2,249.7	2,690.7	1,952.0
Total	112	109	102	7,549.3	7,673.3	6,321.5
Southwest:[5]						
50,000 or less	52	38	25	1,464.4	1,125.5	776.3
50,001-100,000	21	19	21	1,445.3	1,356.2	1,468.7
100,001 or greater	9	9	11	1,457.2	1,518.7	1,568.2
Total	82	66	57	4,366.9	4,000.4	3,813.2
West:[6]						
50,000 or less	15	12	10	592.7	492.5	336.7
50,001-100,000	6	7	4	311.7	450.8	246.5
100,001 or greater	6	6	6	936.0	1,376.2	1,468.1
Total	27	25	20	1,840.4	2,319.5	2,051.3
Ports:[8]						
50,000 or less	6	2	2	190.3	54.0	77.5
50,001-100,000	17	11	4	1,296.6	851.5	265.3
100,001 or greater	8	4	5	1,455.2	698.3	799.9
Total	31	17	11	2,942.1	1,603.8	1,142.7
Total compresses	263	226	197	17,268.8	16,140.9	13,709.6
Total, all plants	1,166	759	563	25,138.0	21,961.1	18,134.5

[1] Firms approved by the Agricultural Stabilization and Conservation Service to handle and store government-owned or controlled cotton. [2] Warehouses are storage facilities without compression equipment. [3] Includes Alabama, Georgia, Florida, South Carolina, North Carolina and Virginia. [4] Includes Arkansas, Louisiana, Mississippi, Tennessee and Missouri. [5] Includes Oklahoma and Texas, excluding district 6. [6] Includes Texas district 6, New Mexico, Arizona and California. [7] Compresses are storage facilities with compression equipment. [8] Includes port facilities in Texas, Louisiana, Mississippi and Alabama.

capacity utilization is quite high relative to other areas in some years since yard storage can be practiced in this area.[3]

While the number of warehouses and compresses in each of the various size categories has decreased almost without exception, the dropouts are largely concentrated in the smaller plants.

FUTURE OF THE PUBLIC WAREHOUSING INDUSTRY

The high costs of today's inputs require a reasonable and continuing volume of cotton to enable warehousemen to provide services demanded of them. As evidenced by the surplus of storage space in most of the Cotton Belt, these criteria are not being met. Past research has suggested the availability of economies of size in cotton storage. The stability in the number of large firms supports this hypothesis.[4] However, the decreasing trend in plant numbers suggests increasing average costs. In the short run, increased production may alleviate this problem; however, the industry is faced with a number of problems in competing for available cotton.

The introduction of high capacity gins indicates a trend toward central ginning-warehousing complexes which divert bales from public storage facilities. Additionally, the increasing acceptance of universal density compression at the gin has had an adverse effect on facilities with compression equipment.

Further, forward contracting has adversely affected the industry as additional cotton is being shipped directly from gins to mills, thus bypassing the public storage industry. Regional shifts in production may have a serious impact on the size, efficiency, and importance of the warehousing sector, as it already has in the Southeast. These changes in the marketing system will undoubtedly further contract the public storage segment of the U.S. cotton industry.

[3]Parts of the area have enough dry weather to allow for outside storage when facilities are full.

[4]See Cleveland, O.A., Jr. and M.S. Salkin, "Projection of Cotton Warehouse Facilities for Oklahoma: A Markov Process," *Southern Journal of Agricultural Economics*, Vol. 7, No. 1, July 1975.

Table 21—Commercial cotton storage capacity and utilization by area, 1965-75[1]

Year beginning Aug. 1[2]	Southeast			Southcentral			Southwest			West		
	Capacity	Average inventory	Use	Capacity	Average inventory	Use	Capacity	Average inventory	Use	Capacity	Average inventory	Use
	1,000 bales	*1,000 bales*	*Percent*	*1,000 bales*	*1,000 bales*	*Percent*	*1,000 bales*	*1,000 bales*	*Percent*	*1,000 bales*	*1,000 bales*	*Percent*
1965 . . .	6,296	4,565	72.5	8,657	4,739	54.7	5,387	6,097	113.2	1,855	956	51.5
1967 . . .	6,141	3,898	63.5	8,444	3,239	38.4	5,254	4,813	91.6	1,810	772	42.7
1968 . . .	5,986	2,377	39.7	8,230	2,088	25.4	5,122	3,188	62.3	1,764	735	41.7
1969 . . .	5,576	1,190	21.3	8,938	2,336	26.1	5,667	2,241	39.6	2,153	1,278	59.4
1970 . . .	5,237	988	18.9	8,872	2,770	31.2	5,425	1,730	31.9	2,330	1,083	46.5
1971 . . .	4,315	834	19.3	8,567	2,346	27.4	5,130	1,379	26.9	2,345	847	36.2
1972 . . .	3,757	768	20.5	8,251	1,873	22.7	4,983	863	17.3	2,146	631	29.4
1973 . . .	3,524	797	22.6	8,123	2,452	30.2	4,974	1,548	31.1	2,182	717	32.9
1974 . . .	3,273	771	23.6	6,901	1,363	19.8	4,728	1,846	39.0	2,032	677	33.3
1975 . . .	3,223	1,005	31.2	6,900	1,569	22.7	4,618	1,463	31.7	2,250	1,389	61.7

[1] Does not include the capacity of port facilities; however, inventory and capacity utilization data include cotton stored in port facilities; Southeast area includes Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia; Southcentral area includes Mississippi, Tennessee, Missouri, Arkansas, and Louisiana; Southeast area includes Texas and Oklahoma; Western area includes New Mexico, Arizona, and California.
[2] 1966 data not available.

KNIT CLOTH AND APPAREL TRADE PATTERNS

by

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ABSTRACT: This article updates an earlier study of trends in imports and exports of knit cloth and apparel since 1965. Estimates are made for 1975. Average annual growth rates are presented for three fiber groups—cotton, wool, and manmade fibers—for both knit and total cloth (knit plus woven) and apparel.

KEYWORDS: Textile trade, knits, cloth, apparel.

INTRODUCTION

Textile trade activity, although off in 1975, remains at a relatively high level. The devaluation of the dollar, which helped boost exports in 1974, continued its positive effect in 1975 despite the economic downturn in late 1974 and early 1975. Exports of textile goods this year are estimated around 679 million pounds, down 16 percent from 1974 but the second largest on record. Textile imports, influenced by the negative effect of devaluation and the recent recession, are estimated at about 872 million pounds, 8 percent below 1974. The volume of knit cloth and apparel textile trade, while smaller than their woven counterparts, continues to experience higher growth rates. Imported knit apparel, reflecting their popularity with the American public, is the most important category of knit textile trade. Cotton continues to dominate the knit underwear and T-shirt markets. Manmade fibers constitute most of the knit outerwear apparel. Wool knit products moving in textile trade are relatively small and declining because of increasing competition from manmade fibers.

KNIT TEXTILE IMPORTS

Imports of knit textiles in 1975, estimated at 243 million pounds, were a tenth above a year earlier, thanks to larger apparel imports. Apparel shipments totaled 229 million pounds, third highest on record (figure 12 and table 19). These imports experienced an average annual growth rate of 16 percent during 1965-75.[1] Although knit cloth imports have had a similar growth rate over the past decade, shipments have been on a much smaller scale.

CLOTH

Imported knit cloth of 15 million pounds in 1975 was down 6 percent to the lowest level since 1969 (figure 13). In fact, the quantity has been declining each year since the peak year of 60 million pounds in 1971. In addition to the factors affecting the lessening of knit apparel imports, knit cloth imports have relatively unfavorable apparel manufacturing economics in the United States compared to the cost of imported finished apparel.

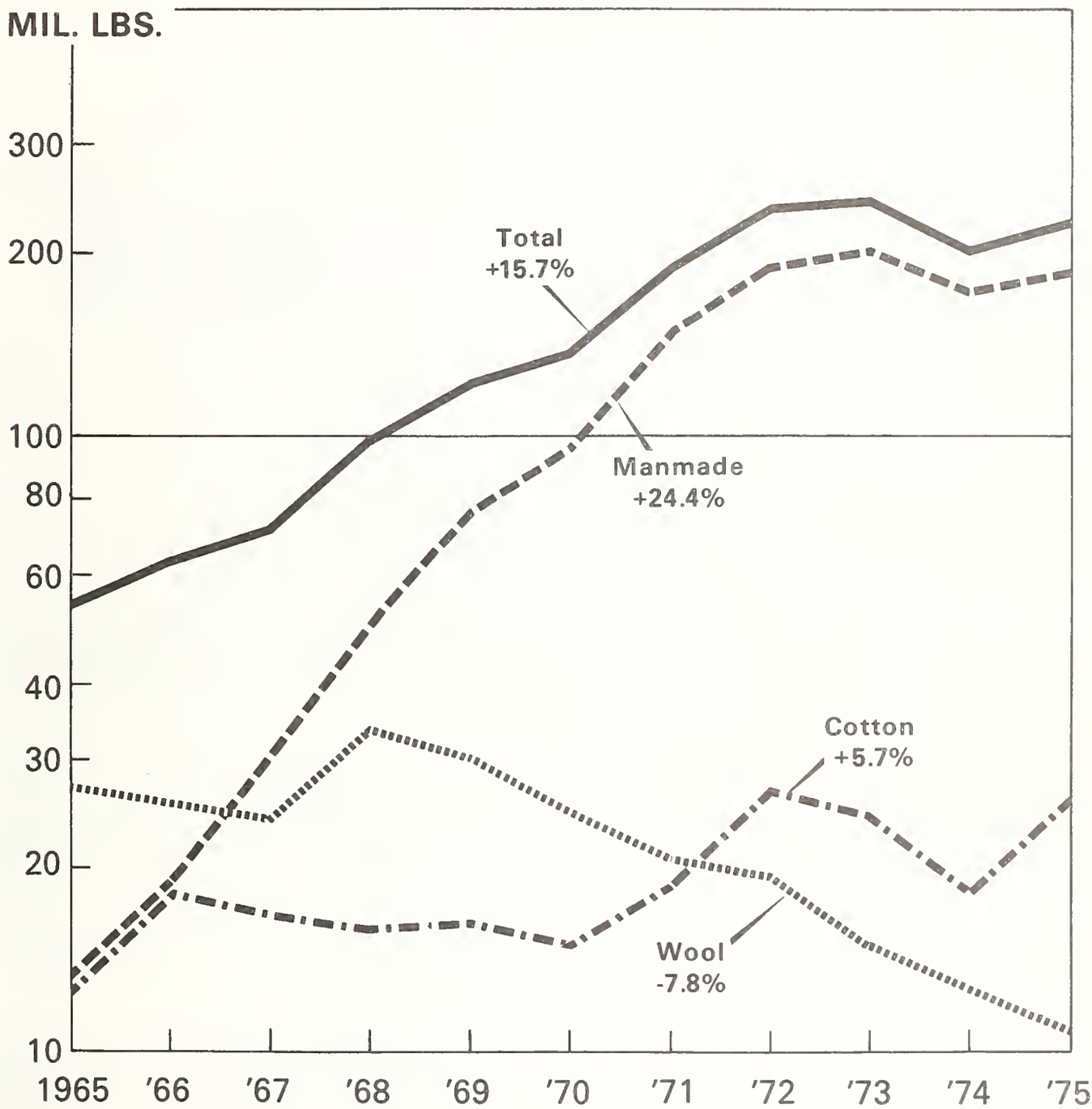
As in recent years, manmade fibers constituted almost all of the imported knit cloth in 1975. Even though the estimated 14 million pounds imported this year was less than a quarter of 1971's peak quantity, it was more than twice the quantity imported during the late 1960's. It is this relatively low base that results in manmade fiber cloth imports having a rather large average annual growth rate of 17 percent over the 11 year period. Although cotton constituted 70 percent of total cloth imports, it was only 1 percent of knit cloth imports in 1975.

APPAREL

Knit apparel imports are also dominated by manmade fibers which constitute 84 percent of the market. Although the quantity of manmade knit apparel imported in 1975 increased moderately to about 191 million pounds, it has remained within the 175-205 million pound range since 1972. The changing fashions and economic conditions mentioned earlier were possible factors in this plateau effect. Nevertheless, demand for imported manmade knit apparel has increased at an average annual rate of 24 percent since 1965. Again, this

[1]Average annual growth rates are based on trend lines of the general form $y=ar^x$. On semilogarithmic charts, it is a straight line and has the equation form, log y = log a + log r (x). The slope of this line is log r, which when expressed as (r - 1.000) 100 is the percentage average annual growth rate of the trend line.

KNIT APPAREL IMPORTS



USDA

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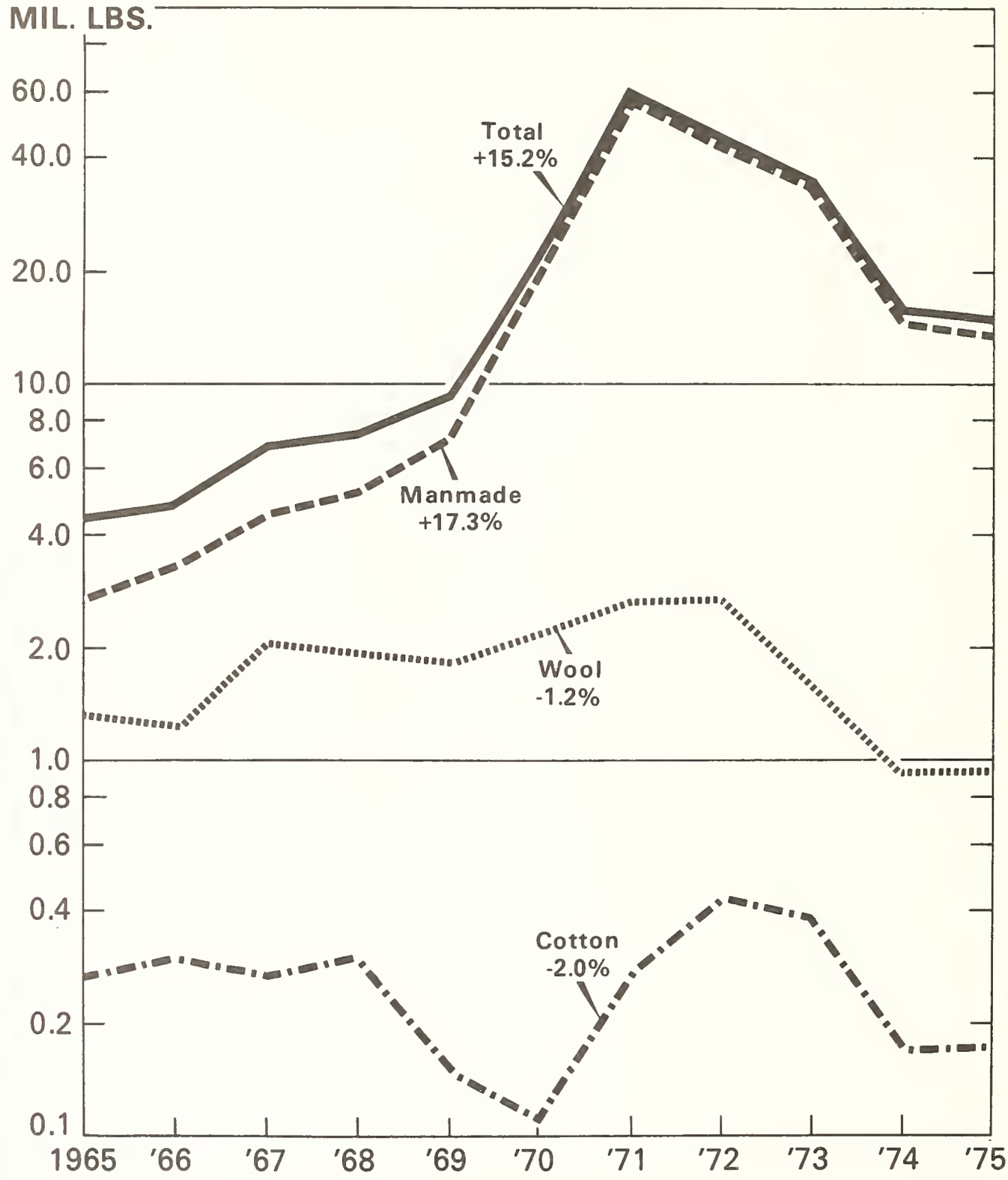
Figure 12

KNIT CLOTH IMPORTS



USDA

NEG. ERS 2297-75 (11)

Figure 13

Table 19—U.S. imports of cloth and apparel

Item	1967	1968	1969	1970	1971	1972	1973	1974	1975	Average annual growth rate 1965-75
	Thousands of pounds of equivalent fiber									*Percent*
Cotton										
Knit cloth	268	304	147	106	267	426	279	168	173	-2.0
Total cloth[1]	227,803	229,163	264,597	257,856	264,405	340,403	324,214	278,214	182,037	+2.3
Knit apparel	16,722	16,260	16,121	15,086	18,936	26,838	24,169	18,561	26,075	+5.7
Total apparel[1]	133,092	134,979	142,716	142,707	149,404	177,893	161,738	168,310	204,701	+4.7
Wool										
Knit cloth	2,006	1,930	1,840	2,180	2,690	2,704	1,609	907	919	-1.2
Total cloth[1]	26,325	34,626	31,037	26,123	14,410	11,469	13,992	9,251	10,053	-10.6
Knit apparel	24,371	32,845	30,601	25,207	21,323	19,978	14,968	12,735	11,159	-7.8
Total apparel[1]	30,771	41,358	41,473	38,124	31,218	27,459	27,241	23,883	21,093	-4.4
Manmade fibers										
Knit cloth	4,441	5,169	7,213	19,610	57,388	42,525	32,905	14,405	13,520	+17.3
Total cloth[1]	37,155	43,255	55,535	74,578	123,957	114,852	99,818	61,414	66,153	+9.0
Knit apparel	30,692	50,310	76,851	96,523	150,000	190,294	204,602	175,340	191,395	+24.4
Total apparel[1]	60,886	91,329	143,547	187,834	255,874	283,489	285,786	251,979	280,444	+13.0
Grand total										
Knit cloth	6,715	7,403	9,200	21,896	60,345	45,655	34,793	15,480	14,612	+15.2
Total cloth[1]	291,283	307,044	351,169	358,557	402,772	466,724	438,024	348,879	258,243	+2.7
Knit apparel	71,785	99,415	123,573	136,816	190,259	237,110	243,739	206,636	228,629	+15.7
Total apparel[1]	224,749	267,666	327,736	368,665	436,496	488,841	474,765	444,198	506,238	+10.6

[1] Knit plus woven.

Bureau of the Census.

rapid increase reflects the relatively small imports of the late 1960's.

Cotton knit apparel imports in 1975 are estimated at 26 million pounds, up 40 percent from a year earlier. In recent years, cotton knit apparel has been about 11 percent of total knit apparel imports, while cotton total (woven plus knit) apparel imports have represented about 37 percent of total apparel imports. Cotton knit apparel imports have had a 6 percent average annual growth rate during the past decade. Wool knit apparel imports have declined every year from their high point of 33 million pounds in 1968 to an estimated 11 million in 1975. This falling off has resulted in an average annual rate of decline of 8 percent since 1965.

KNIT TEXTILE EXPORTS

In contrast to earlier years, estimated textile exports in 1975 of 679 million pounds were only 22 percent less than imports. The years 1974 and 1975 saw the quantities of total (knit plus woven) cloth and knit cloth exports exceed the comparable imported product for the first time since 1969. Total cloth exports, estimated at 364 million pounds in 1975, increased at an average annual rate of 9 percent during 1965-75, while knit cloth exports increased at a 10 percent rate (figure 14 and table 20). As in previous years, the quantity of both total apparel and knit apparel exports in 1975 were small fractions of the comparable imported products. Cotton and manmade fibers dominate the cloth and apparel export markets. Wool accounts for about 2 percent of apparel exports and 1 percent of cloth exports.

CLOTH

Cotton had about 27 percent of the knit cloth export market while manmade fibers accounted for about 72 percent of these exports in 1975. Manmade fiber cloth exports were estimated at 150 million pounds and the annual growth rate averaged 10 percent over the past 11 years. Manmade fiber knit cloth exports were around 12 million pounds in 1975 with a 9 percent annual growth rate during the period. They are about 8 percent of manmade fiber cloth exports. Total cotton cloth exports in 1975, estimated at 212 million pounds, were the second highest quantity of the past 11 years, having an 8 percent average annual growth rate. Cotton knit cloth exports were estimated at 5 million pounds with a growth rate of 13 percent. Wool cloth exports remained very small in 1975.

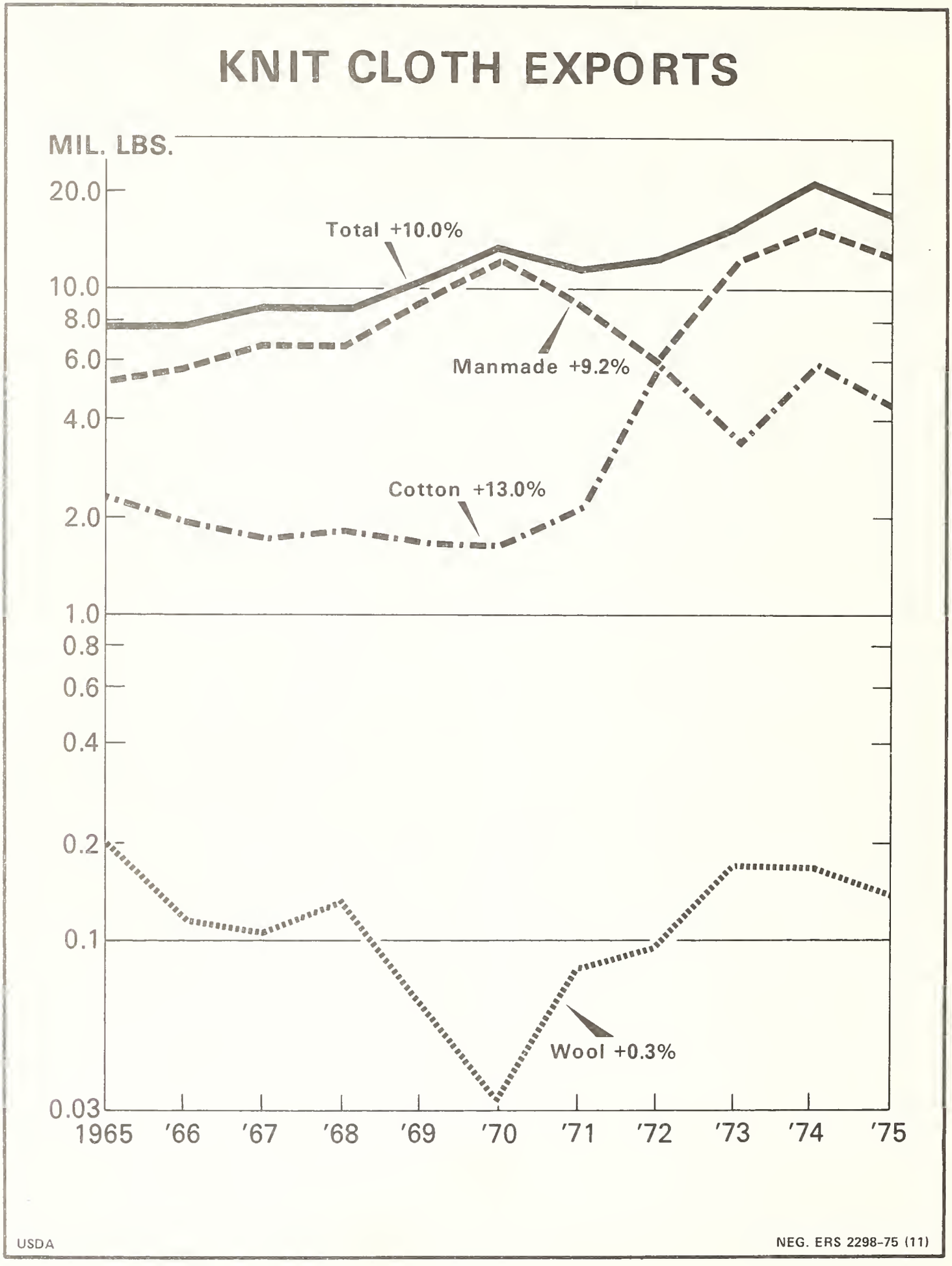

KNIT CLOTH EXPORTS
MIL. LBS.
20.0
10.0
8.0
6.0
4.0
2.0
1.0
0.8
0.6
0.4
0.2
0.1
0.03
Total +10.0%
Manmade +9.2%
Cotton +13.0%
Wool +0.3%
1965
'66
'67
'68
'69
'70
'71
'72
'73
'74
'75
USDA
NEG. ERS 2298-75 (11)

Figure 14

Table 20—U.S. exports of cloth and apparel

Item	1967	1968	1969	1970	1971	1972	1973	1974	1975	Average annual growth rate 1965-75
	Thousands of pounds of equivalent fiber									*Percent*
Cotton										
Knit cloth	1,788	1,824	1,684	1,695	2,131	6,024	3,362	5,695	4,584	+13.0
Total cloth[1]	119,797	115,202	118,171	113,932	130,844	174,482	199,825	228,024	212,148	+8.3
Knit apparel	2,694	2,809	2,756	2,769	2,732	3,301	5,166	7,372	7,395	+12.4
Total apparel[1]	23,152	27,475	35,770	29,969	30,237	34,333	29,917	40,089	41,248	+7.1
Wool										
Knit cloth	113	128	60	33	83	95	177	173	141	+.3
Total cloth[1]	550	496	395	403	469	599	1,069	924	1,289	+7.8
Knit apparel	535	472	303	305	306	434	917	944	432	+7.6
Total apparel[1]	1,038	1,045	1,019	993	955	1,351	2,344	3,414	1,975	+13.8
Manmade fibers										
Knit cloth	6,796	6,683	9,138	12,148	9,186	6,089	12,008	15,217	12,209	+9.2
Total cloth[1]	74,554	72,055	78,874	80,236	73,802	85,317	129,358	165,552	150,140	+9.9
Knit apparel	3,399	3,980	4,491	4,649	5,658	7,214	9,933	13,712	12,243	+18.2
Total apparel[1]	8,019	9,730	12,621	12,800	16,137	20,789	24,766	33,085	31,377	+18.7
Grand total										
Knit cloth	8,697	8,635	10,882	13,876	11,400	12,208	15,547	21,085	16,934	+10.0
Total cloth[1]	194,901	187,753	197,440	194,571	205,112	260,398	330,252	394,500	363,577	+8.9
Knit apparel	6,628	7,261	7,550	7,723	8,696	10,949	16,016	22,028	20,070	+15.6
Total apparel[1]	32,209	38,250	49,410	43,762	47,329	56,473	57,027	76,588	74,600	+11.0

[1] Knit plus woven.

Bureau of the Census.

Apparel

Cotton had about 55 percent of total apparel exports while manmade fibers accounted for about 42 percent in 1975. Both manmade fiber total apparel exports of 31 million pounds and manmade knit apparel exports of 12 million were the second highest on record (figure 15). Their average annual growth rates have been 19 percent and 18 percent, respectively, since 1965. Manmade fiber knit apparel was about 39 percent of manmade fiber apparel exports. Cotton apparel exports, estimated at 41 million pounds, and cotton knit apparel exports, estimated at 7 million, were all-time highs. Their average annual growth rates were 7 percent and 12 percent respectively. Cotton knit apparel exports represented 18 percent of total cotton apparel exports.

Wool apparel exports in 1975 were estimated at 2 million pounds, of which about 22 percent were knits. The average annual growth rate of wool apparel exports was 14 percent the last 11 years.

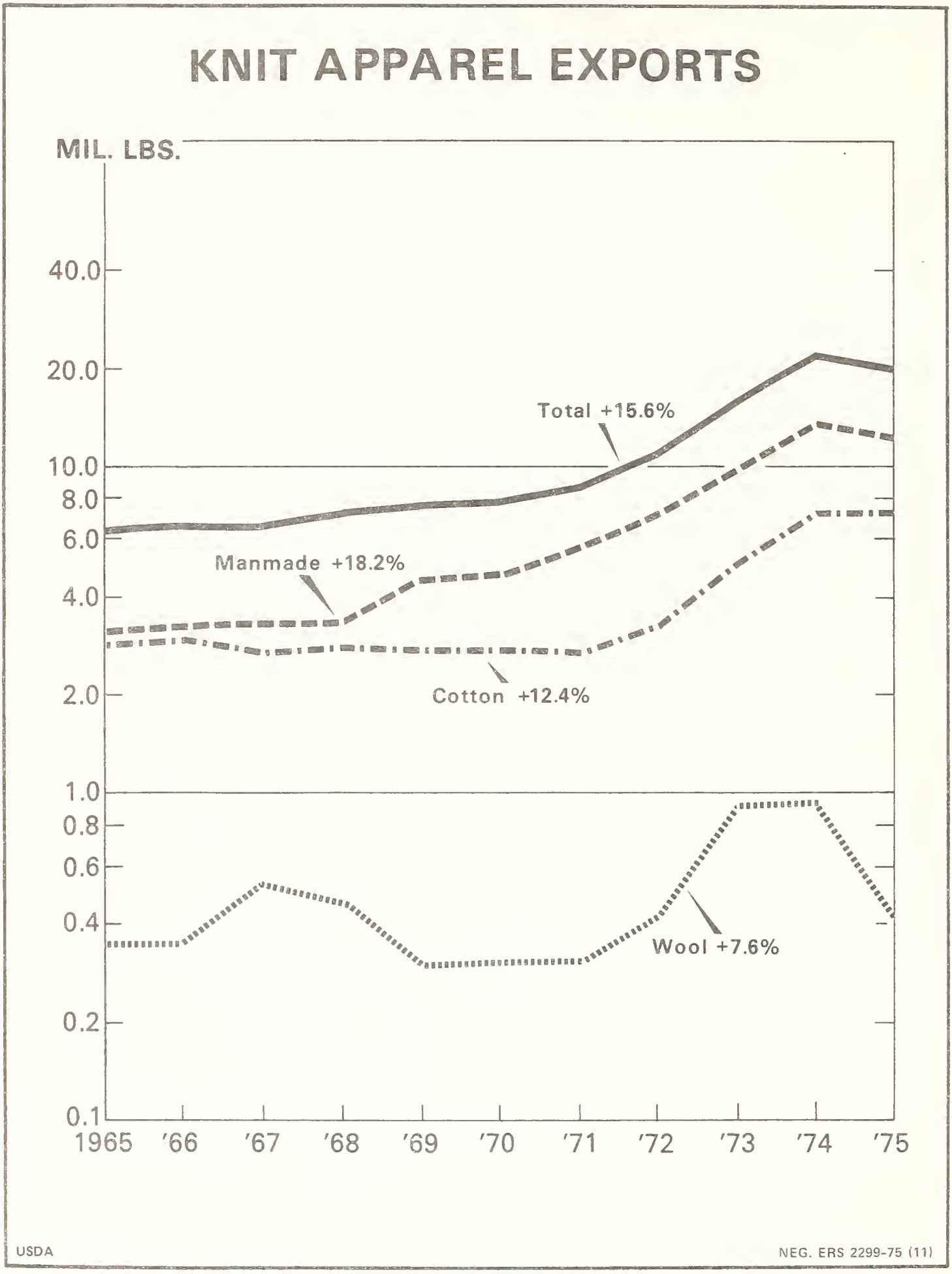

KNIT APPAREL EXPORTS
MIL. LBS.
40.0
20.0
10.0
8.0
6.0
4.0
2.0
1.0
0.8
0.6
0.4
0.2
0.1
Total +15.6%
Manmade +18.2%
Cotton +12.4%
Wool +7.6%
1965
'66
'67
'68
'69
'70
'71
'72
'73
'74
'75
USDA
NEG. ERS 2299-75 (11)

Figure 15

SOME RECENT TRENDS IN THE DOMESTIC MARKETING SYSTEM FOR TEXTILE FIBERS AND PRODUCTS

by

Ray S. Corkern
National Economic Analysis Division
Economic Research Service

ABSTRACT: The domestic marketing system for textile fibers and products is divided into many sequential steps beginning with production and ending with consumer expenditures for textile and apparel products. Use profiles, physical flows, shipments, and purchasing patterns are used to indicate changes that have occurred between 1964 and 1974. **KEYWORDS**: Textiles, fibers, and apparel.

The domestic marketing system for textile fibers and products involves numerous stages between fiber production and consumer expenditures. This study examines some of these stages, including such intermediate steps as fiber consumption, use profile, movement through the system, industry shipments, and retail store purchases. Adjustments occur at each step in the system when fiber supplies and demand for textile products contracts or expands.

U.S. Fiber Production and Consumption

In 1974, U.S. production of the major textile fibers exceeded 13 billion pounds (table 21). A comparison of 1964 and 1974 production is used to illustrate the short term relative changes in the production of specific fibers. The temporary reduction in total fiber production during 1974 due to raw material shortages and slackening fiber demand had little effect on the short term relative changes among the various types of fiber.

Cotton and wool represented 41 percent of total production and manmade fibers such as rayon, nylon, polyester, and glass accounted for the remainder. In 1964 the pattern was reversed, i.e. cotton and wool accounted for 71 percent of production.

Geographically, cotton production has shifted westward during recent years and now is centered primarily in the Far West, Southwest, and Delta. Less than 10 percent of the 1975 cotton crop was produced in the Southeast, compared to 16 percent in 1964. Wool is produced mainly in the Western half of the United States and manmade fiber production is concentrated on the Eastern seaboard.

Between 1964 and 1974, total domestic fiber consumption increased about 3.7 billion pounds or 42 percent, (table 21). However, if 1974 consumption had equaled the 1973 level, consumption would have increased about 5.4 billion pounds or 63 percent from 1964. Despite the weak demand for fibers and textile products in 1974 and early 1975, the longer term trend of expansion will likely resume.

Cotton, wool, rayon, and acetate domestic con-

Table 21—U.S. production and consumption of fibers, 1964 and 1974

Fiber	1964			1974		
	Production	Consumption[1]		Production	Consumption	
		Total	Per capita		Total	Per Capita
	Million pounds	*Million pounds*	*Pounds*	*Million pounds*	*Million pounds*	*Pounds*
Cotton	7,269.6	4,331.3	22.6	5,469.6	3,419.5	16.1
Wool, clean basis	119.6	490.8	2.6	67.7	141.5	.7
Rayon and acetate	1,431.8	1,528.6	8.0	1,198.8	1,103.5	5.2
Noncellulosic, manmade	1,406.7	1,575.1	8.2	6,226.4	6,561.4	31.0
Glass	239.5	(1)		682.9	(1)	
Total	10,467.2	7,925.8	41.3	13,645.4	11,225.9	55.0

[1] Included in Noncellulosic total.

Cotton Situation, and Textile Organon.

sumption declined from 1964 to 1974. However, sharply larger noncellulosic use boosted total per capita fiber consumption 28 percent during the period. The consumption pattern, as with the production pattern, has reversed. Cotton and wool consumption were 62 percent of the total in 1964 and only 32 percent in 1974. The opposite trend is shown for the noncellulosics.

The consumption of textile fibers in terms of market share, product category, and type of apparel has undergone major changes since 1964. Cotton's share of the total domestic textile market declined from 46 percent in 1964 to 29 percent in 1974 (table 22). Cotton's share declined in each major product category. The smallest decline was in the industrial product category. Textile fiber consumption by broad product categories and types of apparel is shown in table 23. Some gain in usage for cotton and a substantial increase for other fibers are evident for the household product category. A decline in usage of all fibers is shown for the industrial category although cotton's decline was modest. Cotton apparel usage declined and other fibers made a modest gain. Between 1964 and 1974 only a small percentage change occurred between the three types of apparel. Cotton usage in men's, youth, and boy's apparel increased slightly but declined a little in women's and children's categories. For other fibers, a small percentage increase occurred in the men's, youth, and boys' and girls', children's and infants' apparel, but declined in women's, misses' and juniors' apparel.

The apparel fiber consumption profile by type of construction for 1971 through 1974 is shown in table 24. The percentage of all fibers used for knits has an upward trend. For cotton the percentage used for knits and wovens is relatively stable. The use of other fibers show a marked shift toward knits moving from 53 percent in 1971 to 62 percent in 1974.

Table 22—Market share of textile fibers by major product category, 1964 and 1974

Category	1964		1974[1]	
	Cotton	Others	Cotton	Others
	Percent	*Percent*	*Percent*	*Percent*
Apparel	63	37	37	63
Household	57	43	24	76
Industrial	28	72	22	78
Total	46	54	29	71

[1] Preliminary.

Cotton Counts Its Customers, National Cotton Council of America.

Table 23—Consumption profile for cotton and other textile fibers by product category and type of apparel, 1964 and 1974

Item	Cotton fiber		Other fibers	
	1964	1974	1964	1974
	Percent	*Percent*	*Percent*	*Percent*
	Product category			
Apparel	52	48	27	32
Household	31	36	27	46
Industrial	17	16	46	22
	Type of apparel			
Men's youth and boys'	64	69	43	44
Women's, misses' and boys'	21	19	48	45
Girls', children's and infants'	15	12	9	11

Cotton Counts Its Customers. National Cotton Council of America.

Table 24—Fiber use in knit and woven apparel, 1971-1974

Construction	1971	1972	1973	1974
	Percent	*Percent*	*Percent*	*Percent*
All fibers				
Knit	43.4	47.2	49.1	50.1
Woven	56.6	52.8	50.9	49.9
Total	100.0	100.0	100.0	100.0
Cotton				
Knit	31.9	31.9	31.4	31.8
Woven	68.1	68.1	68.6	68.2
Total	100.0	100.0	100.0	100.0
Other fibers				
Knit	52.7	58.6	60.8	61.6
Woven	47.3	41.4	39.2	38.4
Total	100.0	100.0	100.0	100.0

Cotton Counts Its Customers, National Cotton Council of America.

Fiber and Product Flows in the Textile Industry

Two methods are used to describe the movement of fibers and products through the textile system. One is the actual physical movement and the other is ownership transfers as represented by warehouse receipts, bills of lading, contract agreements, or other forms of ownership documents.

The movement of raw cotton to domestic mills is somewhat different than the movement pattern for manmade fibers. Cotton first moves from the farm to the gin. As shown in table 25, the number of active gins has declined in each production region during recent years. In the Delta and Southeast, the volume per gin has increased with the decrease in the number of gins. However, in the West and Southwest, both the number of gins and volume per gin have decreased. From these gins, cotton is usually shipped to an interior warehouse but may move directly to a mill or port (figure 16). The number, location, and capacity of cotton warehouses and compresses in 1964/65 and 1972/73 are shown in table 26. During this period, both the number

Table 25—Number of active cotton gins and average volume per gin by location, crop year 1964 and 1974

Region	Active gins		Volume per gin	
	1964	1974	1964	1974
	Number	*Number*	*Running bales*	*Running bales*
West[1]	494	413	6,252	5,322
Southwest[2]	1,635	1,042	2,935	2,675
Valley[3]	1,875	1,230	2,363	2,831
Southeast[4]	1,391	534	1,400	2,463
U.S.	5,395	3,219	2,644	3,519

[1] Arizona, California, Nevada and New Mexico. [2] Oklahoma and Texas. [3] Arkansas, Illinois, Kentucky, Louisiana, Missouri, Mississippi and Tennessee. [4] Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia.

Cotton Production in the United States Crop of 1960 and Cotton Ginnings in the United States Crop of 1974, Bureau of the Census.

Table 26—Number, location and capacity of cotton warehouses and compresses, 1964-65 and 1972-73

Facility	1972-73	1964-65	Percent Change
Warehouses			
Number, total	434	901	-52
Southeast[1]	343	758	-55
South central[2]	34	63	-46
Southwest[3]	57	80	-29
Capacity, total, 1000 bales	4,870	7,854	-38
Compresses			
Number, total	212	263	-19
Southeast[1]	9	12	-25
South central[2]	106	113	-6
Southwest[3]	64	82	-22
West[4]	23	27	-15
Ports[5]	10	29	-66
Capacity, total, 1000 bales	15,256	17,269	-12

[1] Alabama, Georgia, North Carolina and South Carolina. [2] Arkansas, Louisiana, Mississippi, Missouri, and Tennessee. [3] Oklahoma and Texas excluding District 6, Texas. [4] Arizona, California, New Mexico and District 6, Texas. [5] Includes port facilities in Louisiana and Texas.

Chandler, Whitman M., Jr. and Joseph L. Ghetti. Cost of Storing and Handling Cotton at Public Storage Facilities, 1972-73 with Projections for 1974-75. ERS 554, Economic Research Service, U.S. Department of Agriculture, June 1974.

and capacity of warehouses have decreased by 52 percent and 38 percent, respectively, primarily reflecting the sharp drop in raw cotton stocks since 1964. Each region showed a decrease in the number of warehouses. From warehouses, the cotton normally goes to a compress. The number of compresses and capacity have followed similar trends during recent years, declining by 19 percent and 12 percent, respectively. The decrease occurred in each region and at port locations. Shipments of cotton from warehouses to selected designations are only available for the 1960/61 and 1970/71 season. These are presented in table 27 and generally show a regional decline in shipments to each destination. The exceptions are from Western warehouses to other destinations, Southwestern warehouses to interior concentration points and Canada, and South Central warehouses to interior concentration points.

PHYSICAL FLOW OF U.S. COTTON

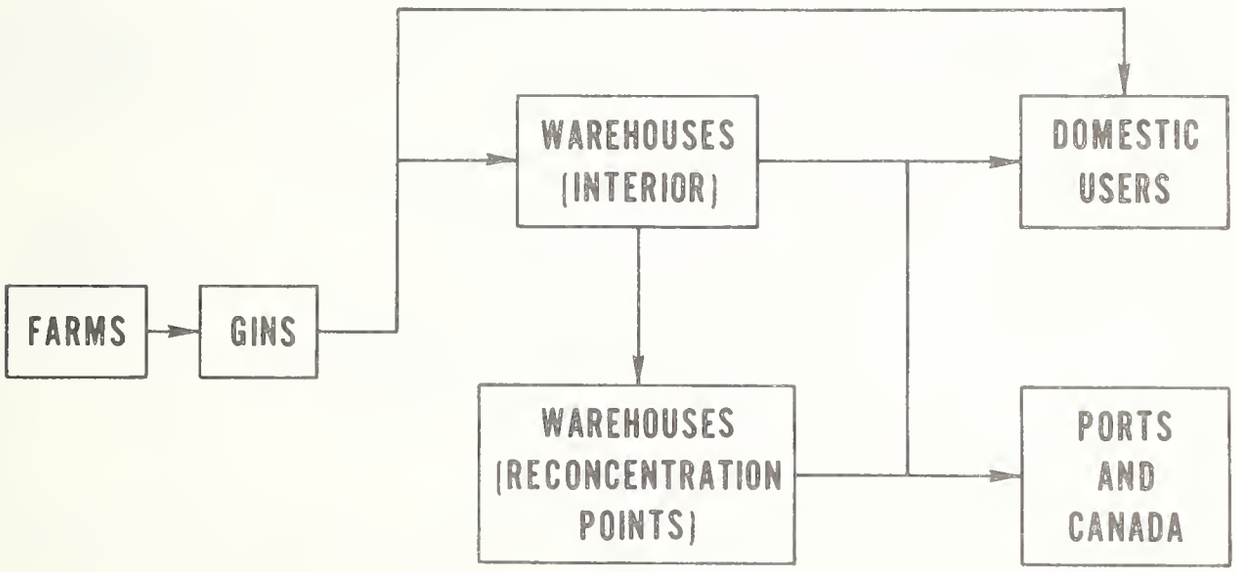


Figure 16

Table 27—Shipments of cotton from regional warehouses to selected destination 1961-62 and 1970-71

Destination	From regional warehouses							
	Western		Southwestern		South central		Southeastern	
	1961-1962	1970-1971	1961-1962	1970-1971	1961-1962	1970-1971	1961-1962	1970-1971
Southeastern mill area								
Percent	45.1	38.4	31.6	32.0	70.2	74.8	92.3	96.1
Bales, 1,000	1,240.9	730.5	1,415.6	1,173.5	3,312.9	3,022.3	2,079.0	1,195.8
New England, eastern and midwestern states								
Percent	1.1	.2	1.2	.7	2.8	.7	.2	---
Bales, 1,000	29.7	3.9	52.8	27.3	129.0	26.8	4.4	.6
Interior concentration points								
Percent	8.4	4.5	7.9	12.4	10.8	12.7	1.3	1.2
Bales, 1,000	227.9	85.4	352.5	453.8	510.4	518.0	28.9	14.5
Canada								
Percent	2.6	.3	1.6	3.3	5.5	3.3	---	---
Bales, 1,000	72.5	5.2	71.6	119.7	259.3	131.9	.5	.2
Ports								
Percent	42.0	52.6	56.3	51.3	8.9	7.1	1.3	.2
Bales, 1,000	1,156.6	997.7	3,522.7	1,880.2	420.5	289.0	30.0	2.2
Others								
Percent	.8	4.0	1.4	.3	1.8	1.4	4.9	2.5
Bales, 1,000	23.0	76.7	63.9	9.3	85.5	54.6	110.8	31.0

Ghetti, Joseph L., Zolon M. Looney and Shelby H. Holder, Jr. Domestic Shipments of U.S. Cotton, 1970-71 Season, Stat. Bulletin No. 483, Economic Research Service, U.S. Department of Agriculture, March 1972. Potter, Joseph R., Jr. The Traffic Pattern of American Raw Cotton Shipments, Season 1961-62, MRR. 705, Economic Research Service, U.S. Department of Agriculture, April 1965.

Rail and truck shipments of cotton from regional warehouses are shown in table 28. Between 1960/61 and 1970/71, truck shipments have gained in importance except in the Southwestern region. In this region the percentage shipped by rail increased from 78 percent to 86 percent.

The physical movement of manmade fibers is usually direct from the fiber producer to the domestic textile mills. The flow of ownership documents for cotton may move into a number of channels (figure 17). The flow of ownership documents for manmade fibers is also usually direct from fiber producers to domestic mills.

Once cotton or manmade fibers reach the domestic mill level, the physical movement and ownership document transfers are similar, (figure 18). For example, if fibers are purchased by integrated mills, the manufacturing functions from fiber preparation to finished textile products may be accomplished without intermill ownership document transfers. However, intraplant physical movement may be required. If fibers are purchased by nonintegrated mills, intermill transfer documents and physical movement are required. These mills usually perform one or more specialized manufacturing functions such as yarn spinning, weaving, or finishing fabrics.

The major flows of ownership changes for textile and apparel products from domestic mills to final consumers are shown in figure 19. Integrated domestic textile mills may perform all the functions up to the retail level with or without intrafirm physical movement or ownership document transfers. The manufacturing or market functions between the mill and the final consumer may also be performed by nonintegrated mills. These mills

Table 28—Shipment of cotton from regional warehouses by mode of transportation, 1960-61 and 1970-71

From regional warehouses	Bales shipped		Rail		Truck	
	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
	1,000 bales	*1,000 bales*	*Percent*	*Percent*	*Percent*	*Percent*
Western	2,750.5	1,899.3	80.5	46.7	19.5	53.3
Southwestern	4,479.1	3,663.8	77.5	86.3	22.5	13.7
South central	4,717.5	4,037.5	79.1	61.6	20.9	38.4
Southeastern	2,253.6	1,244.3	45.0	35.2	55.0	64.8

Ghetti, Joseph L., Zolon M. Looney and Shelby M. Holder, Jr. Domestic Shipments of U.S. Cotton, 1970-71 Season, Stat. Bulletin No. 483, Economic Research Service, U.S. Department of Agriculture, Mar. 1972. Potter, Joseph R., Jr. The Traffic Pattern of American Raw Cotton Shipments, Season 1961-72, MRR 705, Economic Research Service, U.S. Department of Agriculture, Apr. 1965.

FLOW OF OWNERSHIP DOCUMENTS FOR MERCHANDISING U.S. COTTON

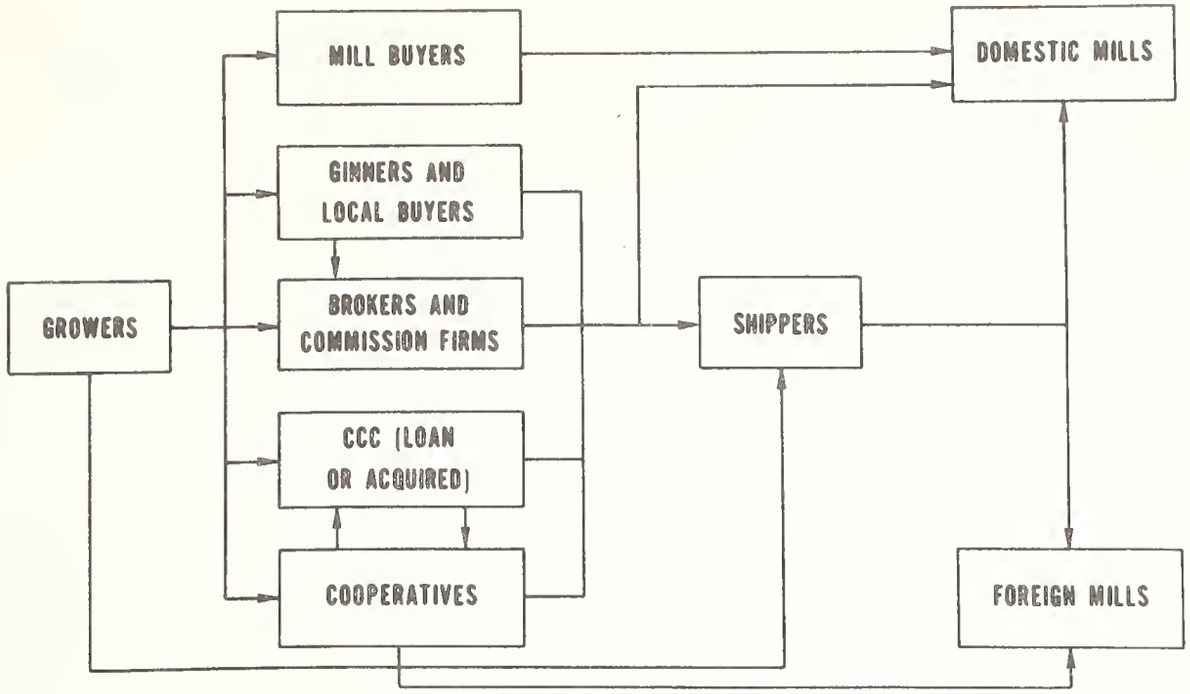


Figure 17

PHYSICAL FLOW OF FIBERS THROUGH DOMESTIC TEXTILE MILLS

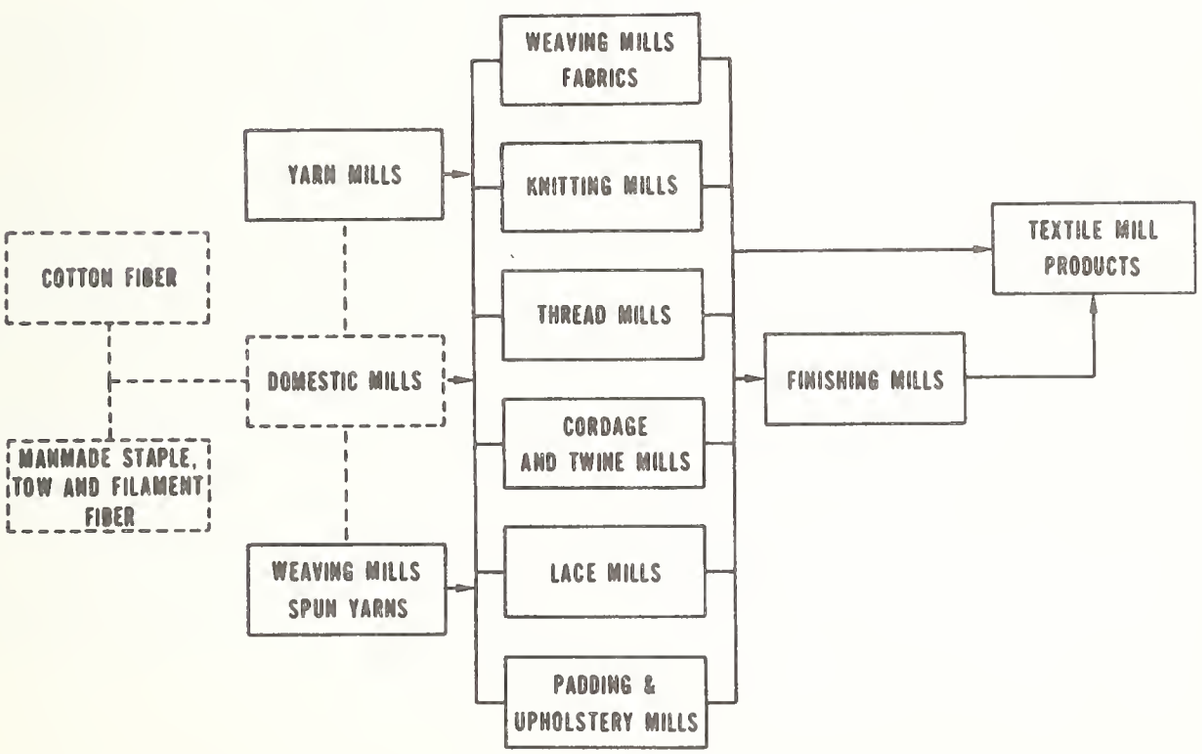


Figure 18

may take either the ownership of the mill products, or perform the functions on a commission or contract basis without taking ownership.

Textile and Apparel Industry Shipments

The value of shipments of textile and apparel products provides an indication of industry size. Output is divided into two product groupings—textile mill products and apparel products. The textile mill products group primarily spins, weaves, knits, finishes fabric, and produces rugs and carpets, while the apparel group primarily manufactures apparel and allied products such as dresses, blouses, pants, and house furnishings.

Between 1964 and 1973, the total value of textile and apparel shipments increased from $35 to $61 billion, or 76 percent (table 29). The value of textile mill shipments increased 84 percent while apparel shipments increased 68 percent.

Table 29—Value of textile industry shipments, 1964 and 1973

Products	1964	1973	Percent change
	Billion dollars		*Percent*
Textile mill	17.0	31.3	+84.1
Apparel and accessories	17.9	30.0	+67.6
Total	34.9	61.3	75.6

Survey of Current Business. U.S. Department of Agriculture.

Consumer Expenditures for Clothing

Slightly over 6.5 percent of our per capita disposal personal income is spent for clothing, (table 30). Since 1964, this rate has remained relatively constant.

Table 30—Per capita disposable personal income and personal consumption expenditures for clothing, 1964-1973

Year	Disposable personal income	PCE for clothing	
	Dollars	*Dollars*	*% of DPI*
1964	2,283	147.51	6.5
1973	4,295	284.15	6.6

In 1973 consumers spent almost $60 billion on clothing (table 31). This represented a 111 percent increase over 1964. The percentage increase is about the same for women and children's clothing and men and boys' clothing. Thus, the ratio of expenditures for women and girls', and men and boys' clothing remains near the 65/35 level.

Table 31—Personal consumption expenditure for clothing, 1964 and 1973

Year	Women's and children		Men and boys'		Total
	Million dollars	*Percent*	*Million dollars*	*Percent*	*Million dollars*
1964	18,338	64.8	9,970	35.2	28,308
1973	38,862	65.0	20,923	35.0	59,785

Survey of Current Business. U.S. Department of Agriculture.

The type of stores in which apparel purchases are made is shown in table 32. Department stores are the leading outlet for women's and girls' and men's and boys' apparel. In 1967, this outlet accounted for 45 and 39 percent, respectively. Women's and girls' and men's and boys' clothing stores account for another 31 and 32 percent.

Table 32—Clothing purchases by type of store, 1963 and 1967

Type of store	Women's-girl's		Men's-boys'	
	1963	1967	1963	1967
	Percent	*Percent*	*Percent*	*Percent*
Department store	38.8	44.5	33.4	39.2
Women's clothing	34.4	30.5	1.4	1.4
Men's and boys' clothing	.5	.5	34.2	32.1
Family clothing	7.5	7.3	14.1	12.1
Limited price	6.1	5.6	3.9	3.3
General merchandise	4.7	4.8	6.3	6.1
Others	8.0	6.8	6.7	5.8

Census of Manufacturers. Bureau of the Census.

Summary

The physical flow of cotton and manmade fibers through the marketing system is similar. The real difference in the flow pattern is prior to the mill level. This is also the case with ownership transfer documents.

A number of trends relating to the overall textile system have been presented for the 1964-1974 period. These show that (1) total fiber production and consumption have increased with cotton and wool obtaining a smaller share, (2) only slight changes have occurred in the consumption profile for cotton by product categories and type of apparel, although substantial changes have occurred for other fibers in the household and industrial product categories, (3) knit fabrics have increased their share of the apparel market, (4) textile industry shipments and personal expenditures for clothing have expanded, (5) percentage of disposable income spent for clothing has remained relatively stable, and (6) department stores remain the major retail outlet for apparel.

MAJOR FLOW OF OWNERSHIP CHANGES FOR TEXTILE AND APPAREL PRODUCTS

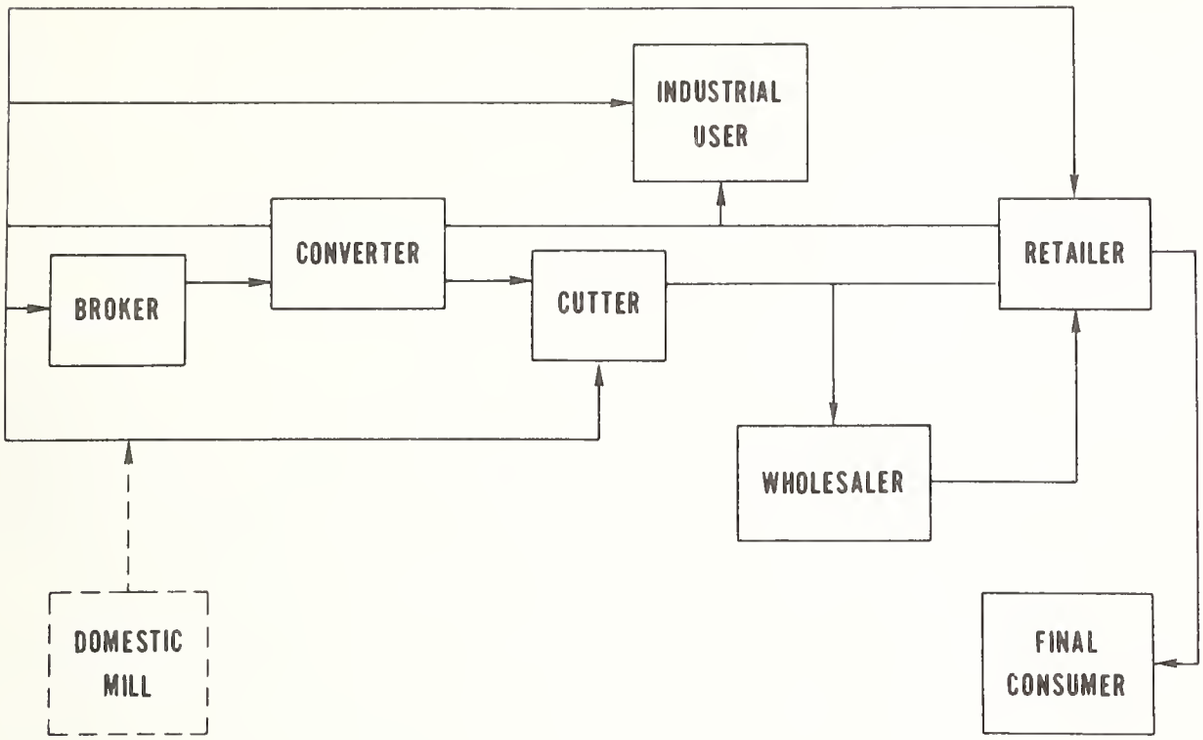


Figure 19

COST OF MERCHANDISING U.S. COTTON, 1974/75 SEASON

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ABSTRACT: Detailed estimates of the major costs of merchandising U.S. cotton during the 1974/75 season are presented. The weighted average cost of assembling and distributing to all domestic and foreign outlets was $38.63 per bale, up 43 percent from 1972/73. Costs were developed from each of four regions to ten outlets. Also, costs were developed from major market trading areas to specific domestic and foreign market outlets.

KEYWORDS: Cotton, shippers, marketing, costs.

INTRODUCTION

The movement of raw cotton from farms to domestic textile mills and foreign ports requires numerous marketing functions and many physical activities. These functions and activities provide the vital link between the cotton producer and the cotton consumer. Costs associated with these movements are substantial and are of concern to both the producer and user of raw cotton. Despite some cost reductions in the marketing system, merchandising costs continue to increase and represent more than half of the total spread between the farm value of cotton and the value or price delivered to textile mills. Furthermore, the level of off-farm costs is generally above that of our major foreign competitors, thereby enabling them to compete more effectively with U.S. cotton in the world market.

This report provides estimates of cotton merchandising costs from major U.S. production areas to selected domestic and foreign outlets for the 1974/75 season. Similar estimates have been made periodically, the last for the 1972/73 season.[1] These and other related data are used for measuring changes in marketing costs, analyzing various means of increasing cotton marketing efficiencies, and evaluating the effectiveness of existing and proposed policies and programs relating to the total U.S. fiber system.

METHODOLOGY

The results presented here are based on analyses of data obtained from a sample of cotton shippers located in each of four regions who have merchandising operations in the 12 major market trading areas across the Cotton Belt. Cotton shippers, as defined and used in this study, are firms which usually purchase odd lots of cotton, assemble and sell it in even running lots, and either perform or arrange the various other merchandising services or operations involved in marketing cotton to domestic and foreign outlets. The firms included in this survey were primarily shippers, but many also merchandised some of their cotton in another manner. Data collected and reported on marketing costs, however, relate only to costs associated with shipper operations.

The sample was selected from the shippers who participated in the 1972/73 study. Personal interviews were held with each shipper to obtain merchandising cost and volume information for both domestic and foreign shipments in 1974/75. The shippers interviewed handled approximately 50 percent of all cotton marketed in the U.S. during the 1974/75 season. Information was also obtained from each firm on its methods of purchase and sale. From this information, weighted average purchases, sales, and merchandising costs were computed by trading area, region, and for the United States.

COST ITEMS, REGIONS, AND TRADING AREAS

Costs for which data were collected are shown below. These items represent costs or expenses which normally would be expected for firms merchandising U.S. cotton.

1. *Buying and local delivery*—Commissions or comparable direct buying costs and local delivery expenses.

[1] Chandler, Whitman M., Jr. and Edward H. Glade, Jr., "Shippers' Cost of Merchandising U.S. Cotton, 1972/73 Season." U.S. Dept. Agr. Econ. Res. Ser., AER No. 317, October 1975.

2. *Storage*—Cost associated only with the storing of cotton at warehouses and compresses.

3. *Compression*—Cost associated with the compressing of cotton to standard density, high density, or universal density.

4. *Other warehouse services*—Receiving, outhandling, reweighing, resampling, and other special services.

5. *Transportation*—Domestic freight, ocean freight, and for some areas, wharfage, forwarding, and controlling.

6. *Cotton insurance*—Cost for domestic and marine insurance.

7. *Financing*—Interest, hedging, and exchange fees.

8. *Selling*—Commissions or comparable direct selling costs.

9. *Miscellaneous*—Rejection and quality adjustments on sales, bad debts, and fiber test fees.

10. *Overhead*—Operating expenses not included elsewhere.

The costs and related volume data were tabulated for the four geographic cotton producing regions and for three market trading areas in each region. These regions and areas are:

Region	States	Trading Area
Southeast	Alabama, Georgia, North Carolina, South Carolina	Atlanta, Greenville-Augusta Montgomery
South Central	Arkansas, Louisiana, Mississippi, Tennessee	Memphis Little Rock Greenwood
Southwest	Oklahoma and Texas (except District 6)	Dallas Houston-Galveston Lubbock
West	Arizona, California, Texas District 6	El Paso Fresno-Bakersfield Phoenix

DISTRIBUTION OF SHIPMENTS

In the Southeast region, more than 89 percent of the cotton merchandised by the firms interviewed in 1974/75 was delivered to Group 201 mills (table 1). Group 201 mills represent the primary mill locations in the western half of North and South Carolina. South Central shippers, much like those in the Southeast, merchandised primarily to Group 201 mills. Shipments to this outlet amounted to 40 percent of the volume handled by South Central firms. In the Southwest, about 25 percent of shipments went to Alabama-Georgia mills while over 36 percent of shipments handled by merchants in the West region went to Japan.

Further examination of the data in table 1 shows that a greater percentage of cotton was sold to domestic outlets in 1974/75 than in 1972/73 but considerably less than in 1964/65. The percentage of sales to Group 201 mills was less, but sales to Group 200 mills (eastern half of North and South Carolina) and Alabama-Georgia mills increased.

Japan was the major foreign outlet for U.S. cotton in 1974/75. This continues the trend of the previous 2 periods. However, Japan's share of the export market has declined during this time, particularly in shipments from Southwest merchants. Their shipments to "other foreign," primarily to Taiwan and the Philippines, accounted for more than 23 percent of the cotton merchandised.

NATIONAL AVERAGE COSTS

The national average merchandising cost for shippers selling cotton to domestic and foreign outlets combined was $38.63 per bale for the 1974/75 season, up from $26.98 per bale in 1972/73 (table 2). With the exception of storage and selling commission, all cost categories increased between 1972/73 and 1974/75. Transportation cost increased more than 60 percent and costs for warehouse services, excluding storage and compression, more than doubled. Storage costs declined primarily because of shorter storage periods, but costs per month increased.

Transportation, the largest cost item, was $21.09 per bale to all outlets combined or about 55 percent of the total costs in 1974/75. Compression accounted for 9 percent of the total while other warehouse services and financing each accounted for over 8 percent. Storage cost and selling expense declined about 15 percent and 8 percent, respectively.

The average cost to merchandise a bale of cotton to all domestic outlets combined was $24.14 for the 1974/75 season. This is an increase of 23 percent or $4.57 over the cost for the 1972/73 season. Again, transportation was the largest cost item at $7.56, an increase of 10 percent over 1972/73. Transportation accounted for 31 percent of the total cost while compression represented 14 percent of the total. Other warehouse services and financing costs each accounted for 13 percent of total cost. With the exception of an insignificant movement to "other domestic" outlets, shipments to New England mills have the highest average cost for any domestic outlet—$28.49. The average cost for shipments to Group 201 mills, accounting for 58 percent of total domestic movements, was $23.94 per bale.

The impact of transportation costs on foreign shipments was much greater than on domestic shipments in 1974/75. This cost of $36.42 was 66 percent of the average total cost of $55.05 for foreign movements. Total merchandising costs for foreign shipments were $30.91 higher than for domestic shipments with most of the difference in

Table 1—Shipments of cotton to specified outlets by region and United States, 1964/65, 1972/73 and and 1974/75 seasons[1]

Outlet	Region				United States
	Southeast	South Central	Southwest	West	
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
			1974/1975		
Group 201 mills	89.4	40.2	12.7	23.3	31.5
Group 200 mills	9.5	14.0	4.9	3.4	9.7
New England mills	---	.8	.6	---	.5
Alabama-Georgia mills	1.1	10.9	24.5	.4	11.7
Other domestic	---	---	.7	1.5	.5
Total domestic	100.0	65.9	43.4	28.6	53.9
Japan	---	16.5	7.9	36.5	18.2
Korea	---	6.7	12.3	11.2	8.8
Hong Kong	---	1.2	6.6	2.0	2.6
Europe	---	4.8	6.5	5.7	5.3
Other foreign	---	4.9	23.3	16.0	11.2
Total foreign	---	34.1	56.6	71.4	46.1
All outlets	100.0	100.0	100.0	100.0	100.0
			1972/73		
Group 201 mills	68.3	45.5	14.3	39.6	36.4
Group 200 mills	6.4	8.6	.5	.2	3.7
New England mills	---	.4	.7	.1	.4
Alabama-Georgia mills	25.3	13.9	9.4	1.7	9.1
Other domestic	---	.4	1.5	1.5	1.0
Total domestic	100.0	68.8	26.4	43.1	50.6
Japan	---	17.3	27.7	45.5	28.6
Korea	---	2.3	6.7	1.3	3.0
Hong Kong	---	.1	8.1	1.0	2.5
Europe	---	10.6	7.2	6.1	7.9
Other foreign	---	.9	23.9	3.0	7.4
Total foreign	---	31.2	73.6	56.9	49.4
All outlets	100.0	100.0	100.0	100.0	100.0
			1964/65		
Group 201 mills	28.0	45.5	5.7	59.0	31.2
Group 200 mills	8.0	12.0	3.7	1.4	6.2
New England mills	---	2.5	1.4	2.6	1.8
Alabama-Georgia mills	64.0	17.8	20.8	4.5	21.5
Other domestic	---	---	3.3	2.0	1.7
Total domestic	100.0	77.8	34.9	69.5	62.4
Japan	---	2.1	27.0	8.9	12.7
Korea	---	([2])	([2])	([2])	([2])
Hong Kong	---	([2])	([2])	([2])	([2])
Europe	---	8.6	21.5	7.8	12.3
Other foreign	---	11.5	16.6	13.8	12.6
Total foreign	---	22.2	65.1	30.5	37.6
All outlets	100.0	100.0	100.0	100.0	100.0

[1] 1964/65 data from *Shippers' Services and Costs in Marketing United States Cotton*, Cotton Economic Research, The University of Texas, May 1967. 1972/73 data from *Shippers' Cost of Merchandising U.S. Cotton, 1972/73 Season*, Economic Research Service, U.S. Department of Agriculture, October 1975. [2] Included in "Other foreign."

Table 2—Shippers average cost per bale of assembling and distributing United States cotton, by types of costs and outlets, 1974/75 season

Outlet to which shipped	Buying and local delivery[1]	Storage	Compression	Other warehouse services[2]	Transportation[3]	Cotton insurance[4]	Financing[5]	Selling[6]	Misc.[7]	Overhead[8]	Total[9]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
United States:											
Group 201 mills	1.07	1.71	3.40	3.25	7.54	0.23	3.11	0.85	0.50	2.27	23.94
Group 200 mills	1.00	1.55	3.50	3.39	8.12	.24	3.13	.86	.49	2.22	24.50
New England mills	.92	2.41	3.69	3.06	10.74	.24	3.87	.69	.37	2.51	28.49
Alabama and Georgia mills	1.08	1.40	3.57	3.32	7.07	.24	3.07	.90	.46	2.83	23.93
Other domestic	1.09	3.11	3.34	2.78	8.15	.34	7.95	1.68	.19	3.24	31.86
Total domestic	1.06	1.63	3.45	3.28	7.56	.24	3.16	.87	.49	2.40	24.14
Japan	1.24	1.56	3.49	3.02	36.04	1.88	2.88	.76	.41	2.31	53.59
Korea	1.10	1.52	3.65	3.19	37.52	1.78	3.12	1.12	.44	2.47	55.91
Hong Kong	1.24	1.67	3.86	3.29	38.50	1.70	3.29	.69	.20	2.51	56.94
Europe	1.10	1.68	3.67	3.26	32.28	1.80	3.42	1.09	.37	2.60	51.26
Other foreign	1.37	1.91	3.83	3.34	37.64	1.93	3.64	1.21	.32	2.90	58.09
Total foreign	1.23	1.66	3.64	3.18	36.42	1.85	3.20	.97	.38	2.53	55.05
All outlets	1.14	1.64	3.54	3.23	21.09	1.00	3.17	.92	.44	2.46	38.63

[1] Commissions or comparable direct buying costs and local delivering expenses. [2] Receiving and outhandling and reweighing, resampling and other special services performed. [3] Domestic freight, ocean freight and, for some areas, wharfage, forwarding and controlling. [4] Marine and domestic insurance. [5] Includes hedging, interest and exchange. [6] Commissions or comparable direct selling costs. [7] Rejections and quality adjustments on sales, bad debts and fiber test fees. [8] Operating expenses not included elsewhere. [9] Excludes operating margins. Totals may not always add, due to rounding.

higher transportation cost. It is evident that cotton merchants must seek relief from high ocean freight rates if merchandising costs to foreign outlets are to be reduced.

REGIONAL AND TRADING AREA COSTS

Marketing costs vary between regions, reflecting actual differences in costs or expenses incurred and in market structures and practices. In the 1974/75 season, the weighted average cost to merchandise a bale of cotton to all outlets varied from $46.94 in the West to $11.53 in the Southeast (table 3). The lack of foreign shipments out of the Southeast was primarily responsible for the lower combined costs in that region. Also, there are no compression charges on much of the Southeast cotton and domestic transportation costs are lower than in other regions.

The West had the highest merchandising cost for domestic shipments among the four regions. As noted previously, over 23 percent of all shipments from that region were to Group 201 mills resulting in higher transportation costs. Average transportation costs increased significantly over 1972/73 in all regions except in the Southeast where a slight decrease was noted. Total costs for the Southeast in 1974/75 averaged almost 24 percent lower than in 1972/73 as sample firms interviewed were located closer to textile mills resulting in lower costs for transportation, storage, and financing. In the South Central region, the average total cost to merchandise a bale of cotton to all domestic outlets increased 23 percent from 1972/73, 42 percent in the Southwest, and 37 percent in the West. Higher compression charges, other warehouse services, and transportation accounted for most of these increases.

The Southwest had the highest total per bale cost for foreign shipments—$60.21—almost 65 percent of which was cost of transportation. Transportation also represented 65 percent of the total foreign cost of $53.21 from the West and 68 percent of the total foreign cost of $52.88 from the South Central. Substantial increases were also noted in compression, other warehouse services, and finance charges.

Costs for assembling and distributing a bale of cotton from each region to specific domestic and foreign outlets are shown in table 4. From the South Central region, for example, the cost of merchandising a bale of cotton to Japan was $52.93 and to Europe it was $47.59. It was more expensive to merchandise a bale of cotton to Europe from the Western region than to any other outlet. Comparisons may be made of the data in this table with those in table 2 showing the U.S. average costs to each domestic and foreign outlet.

Merchandising costs from selected trading areas within regions to selected market outlets are shown in table 5. These data show the actual costs, by item, of selling and moving cotton from these major trading areas. Comparisons may be made of the cost items between trading areas as well as with the national and regional average costs in tables 2 and 4, respectively. One comparison indicates that trading area costs in the Southwest and Western regions were generally above the national average, while those for South Central trading areas were below the national average. Differences in cost between these trading areas were due primarily to lower transportation and finance charges in the South Central region.

Table 3—Shippers' average cost per bale of merchandising United States cotton to domestic and foreign outlets and all outlets combined, by types of costs and regions, 1974/75 season

	Southeast			South Central			South West			West			United States		
	Domestic	Foreign	All	Domestic	Foreign	All	Domestic	Foreign	All	Domestic	Foreign	All	Domestic	Foreign	All
	Dol.	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*
Buying and local delivery[1]	0.79	---	0.79	1.04	1.10	1.06	1.22	1.32	1.28	0.98	1.31	1.22	1.06	1.23	1.14
Storage	1.89	---	1.89	1.54	1.60	1.56	1.60	1.56	1.58	2.14	1.82	1.91	1.63	1.66	1.64
Compression	---	---	---	3.66	3.55	3.62	3.53	3.89	3.73	3.30	3.54	3.47	3.45	3.64	3.54
Other warehouse services[2]	1.53	---	1.53	3.43	3.02	3.29	3.48	3.60	3.55	2.66	2.99	2.89	3.28	3.18	3.23
Transportation[3]	2.67	---	2.67	6.55	35.96	16.90	8.70	39.01	25.88	13.43	34.67	28.59	7.56	36.42	21.09
Cotton insurance[4]	.15	---	.15	.22	1.59	.71	.27	1.74	1.10	.30	2.30	1.73	.24	1.85	1.00
Financing[5]	1.90	---	1.90	2.80	2.83	2.81	3.75	3.57	3.65	4.73	3.33	3.73	3.16	3.20	3.17
Selling[6]	.55	---	.55	.81	.81	.81	1.05	1.64	1.38	1.00	.58	.70	.87	.97	.92
Miscellaneous[7]	.17	---	.17	.59	.43	.53	.36	.33	.34	.20	.36	.31	.49	.38	.44
Overhead[8]	1.86	---	1.86	2.16	1.97	2.09	3.29	3.55	3.44	2.53	2.32	2.38	2.40	2.53	2.46
Total[9]	11.53	---	11.53	22.80	52.88	33.38	27.23	60.21	45.93	31.27	53.21	46.94	24.14	55.05	38.63

[1] Commissions or comparable direct buying costs and local delivering expenses. [2] Receiving and outhandling and reweighing, resampling and other special services performed. [3] Domestic freight, ocean freight and, for some areas, wharfage, forwarding and controlling. [4] Marine and domestic insurance. [5] Includes hedging, interest and exchange. [6] Commissions or comparable direct selling costs. [7] Rejections and quality adjustments on sales, bad debts and fiber test fees. [8] Operating expenses not included elsewhere. [9] Excludes operating margins. Totals may not always add, due to rounding.

Table 4—Shippers' average cost per bale of assembling and distributing United States cotton, by regions and outlets 1974/75 season

Region where purchased / Outlet to which shipped	Buying and local delivery[1]	Storage	Compression	Other warehouse services[2]	Transportation[3]	Cotton insurance[4]	Financing[5]	Selling[6]	Misc.[7]	Overhead[8]	Total[9]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Southeast region:											
Group 201 mills	0.81	1.91	---	1.47	2.56	0.16	1.77	0.55	0.18	1.93	11.34
Group 200 mills	.56	1.78	---	2.22	3.29	.06	3.21	.56	.06	1.17	12.90
Alabama and Georgia mills	1.00	2.00	---	0.00	6.20	.15	1.70	1.00	.50	2.50	15.05
All outlets	.79	1.89	---	1.53	2.67	.15	1.90	.55	.17	1.86	11.53
South Central region:											
Group 201 mills	1.05	1.61	3.67	3.48	6.49	.22	2.84	.84	.62	2.13	22.94
Group 200 mills	1.00	1.44	3.62	3.46	7.40	.24	2.73	.78	.56	2.05	23.28
New England mills	1.02	2.61	3.75	2.98	10.29	.24	3.79	.54	.30	2.47	27.99
Alabama and Georgia mills	1.07	1.33	3.62	3.23	5.66	.24	2.64	.79	.52	2.33	21.42
Total domestic	1.04	1.54	3.66	3.43	6.55	.22	2.80	.81	.59	2.16	22.80
Japan	1.14	1.38	3.43	2.95	36.84	1.51	2.57	.87	.44	1.80	52.93
Korea	1.15	1.61	3.62	2.86	36.85	1.70	2.89	.81	.47	2.06	54.02
Hong Kong	.96	2.33	3.75	3.31	36.49	1.80	3.54	.56	.38	2.19	55.31
Europe	1.06	1.52	3.66	3.24	30.59	1.50	2.80	.81	.36	2.07	47.59
Other foreign	.97	2.26	3.75	3.19	36.92	1.76	3.48	.64	.43	2.28	55.69
Total foreign	1.10	1.60	3.55	3.02	35.96	1.59	2.83	.81	.43	1.97	52.88
All outlets	1.06	1.56	3.62	3.29	16.90	.71	2.81	.81	.53	2.09	33.38
Southwest region:											
Group 201 mills	1.50	1.73	3.53	3.55	8.87	0.31	3.99	1.04	.27	3.22	28.01
Group 200 mills	1.14	1.76	3.50	3.48	9.45	.26	4.11	1.07	.42	3.11	28.31
New England mills	.57	1.74	3.50	3.35	12.26	.21	4.12	1.19	.58	2.67	30.19
Alabama and Georgia mills	1.10	1.47	3.53	3.43	8.50	.25	3.50	1.01	.39	3.37	26.56
Other domestic	1.25	2.57	3.50	3.75	4.75	.15	5.00	2.00	.36	3.30	26.63
Total domestic	1.22	1.60	3.53	3.48	8.70	.27	3.75	1.05	.36	3.29	27.23
Japan	1.09	.96	3.67	3.34	39.84	1.94	2.34	.93	.40	4.75	59.26
Korea	.99	1.72	3.63	3.70	40.21	1.58	3.83	1.99	.51	3.35	61.52
Hong Kong	1.39	1.26	4.01	3.47	40.73	1.44	3.03	.76	.07	2.67	58.82
Europe	1.26	1.85	3.81	3.73	30.84	1.82	4.11	1.86	.46	3.55	53.30
Other foreign	1.57	1.67	4.08	3.65	39.89	1.83	3.85	1.89	.24	3.51	62.18
Total foreign	1.32	1.56	3.89	3.60	39.01	1.74	3.57	1.64	.33	3.55	60.21
All outlets	1.28	1.58	3.73	3.55	25.88	1.10	3.65	1.38	.34	3.44	45.93
Western region:											
Group 201 mills	1.00	2.07	3.28	2.65	13.61	.29	4.37	.94	.22	2.49	30.92
Group 200 mills	.84	2.12	3.39	2.89	13.62	.31	5.07	1.24	.12	2.54	32.15
Alabama and Georgia mills	.85	1.68	3.50	2.96	14.43	.15	4.22	1.00	.10	2.00	30.88
Other domestic	1.00	3.40	3.25	2.25	10.00	.45	9.55	1.50	.10	3.20	34.70
Total domestic	.98	2.14	3.30	2.66	13.43	.30	4.73	1.00	.20	2.53	31.27
Japan	1.39	1.94	3.52	3.03	34.11	2.32	3.40	.59	.38	2.32	53.00
Korea	1.15	1.10	3.72	3.11	35.22	2.17	2.61	.53	.29	2.02	51.92
Hong Kong	1.12	2.06	3.50	2.61	33.54	2.52	3.84	.67	.39	2.42	52.67
Europe	.99	1.81	3.52	2.70	38.06	2.46	3.94	.72	.28	2.55	57.02
Other foreign	1.37	2.02	3.48	2.96	34.48	2.25	3.41	.55	.37	2.41	53.30
Total foreign	1.31	1.82	3.54	2.99	34.67	2.30	3.33	.58	.36	2.32	53.21
All outlets	1.22	1.91	3.47	2.89	28.59	1.73	3.73	.70	.31	2.38	46.94

[1] Commissions or comparable direct buying costs and local delivering expenses. [2] Receiving and outhandling and reweighing, resampling and other special services performed. [3] Domestic freight, ocean freight and, for some areas, wharfage, forwarding and controlling. [4] Marine and domestic insurance. [5] Includes hedging, interest and exchange. [6] Commissions or comparable direct selling costs. [7] Rejections and quality adjustments on sales, bad debts and fiber test fees. [8] Operating expenses not included elsewhere. [9] Excludes operating margins. Totals may not always, add, due to rounding.

Table 5—Shippers' average cost per bale of merchandising United States cotton from major trading areas to selected domestic and foreign outlets, 1974/75 season

Trading area where purchased / Outlet to which shipped	Buying and local delivery[1]	Storage	Compression	Other warehouse services[2]	Transportation[3]	Cotton insurance[4]	Financing[5]	Selling[6]	Misc.[7]	Overhead[8]	Total[9]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Memphis area:											
Group 201 mills	1.01	1.43	3.68	3.59	6.17	0.22	2.71	0.79	0.63	2.10	22.34
Group 200 mills	.97	1.32	3.67	3.54	7.22	.24	2.70	.80	.55	2.15	23.17
Alabama and Georgia mills	1.03	1.22	3.64	3.28	5.57	.25	2.60	.79	.51	2.25	21.14
Japan	1.09	1.40	3.64	3.06	36.87	1.60	2.72	.85	.41	2.09	53.73
Korea	1.15	1.53	3.71	2.82	36.74	1.77	2.89	.83	.47	2.18	54.11
Europe	1.00	1.45	3.72	3.33	30.75	1.52	2.80	.82	.34	2.20	47.93
Greenwood area:											
Group 201 mills	1.07	1.59	3.65	3.41	6.58	.22	2.81	.85	.61	2.17	22.96
Group 200 mills	1.04	1.41	3.57	3.37	7.42	.23	2.66	.78	.56	1.98	23.02
Alabama and Georgia mills	1.11	1.29	3.59	3.12	5.66	.23	2.58	.80	.52	2.42	21.32
Japan	1.18	1.27	3.34	2.88	36.62	1.46	2.43	.91	.46	1.68	52.24
Korea	1.17	1.49	3.57	2.83	36.70	1.65	2.75	.85	.47	1.99	53.46
Europe	1.11	1.43	3.61	3.15	30.28	1.45	2.69	.84	.38	1.99	46.94
Dallas area:											
Group 201 mills	1.49	2.12	3.50	3.65	8.01	.36	4.80	1.04	.21	2.93	28.10
Group 200 mills	1.13	1.90	3.50	3.34	8.74	.29	4.43	1.09	.37	2.88	27.67
Alabama and Georgia mills	1.13	2.00	3.50	3.73	7.52	.30	4.60	1.12	.35	2.80	27.04
Japan	1.51	2.25	4.42	3.83	38.48	1.88	4.56	1.17	.10	3.65	61.85
Korea	.83	1.90	3.78	3.79	39.25	1.55	4.40	2.12	.45	2.75	60.81
Europe	1.28	2.07	4.13	3.76	29.88	1.74	4.69	1.69	.28	2.89	52.40
Lubbock area:											
Group 201 mills	1.48	1.55	3.54	3.50	9.26	.29	3.63	1.05	.30	3.34	27.93
Group 200 mills	1.11	1.67	3.50	3.50	9.79	.24	3.91	1.06	.46	3.22	28.45
Alabama and Georgia mills	1.07	1.33	3.54	3.35	8.75	.23	3.21	.99	.42	3.52	26.42
Japan	1.07	.89	3.63	3.32	39.99	1.95	2.21	.92	.42	4.84	59.24
Korea	1.00	1.68	3.60	3.68	40.49	1.58	3.73	1.98	.53	3.45	61.72
Europe	1.23	1.77	3.71	3.72	31.34	1.84	3.92	1.91	.51	3.73	53.69
Phoenix area:											
Group 201 mills	1.30	1.97	3.46	3.17	13.22	.25	3.74	.98	.23	2.28	30.61
Group 200 mills	.64	1.55	3.50	3.17	14.42	.27	3.14	1.15	.07	2.31	30.23
Alabama and Georgia mills	.85	1.40	3.50	2.90	14.15	.15	4.30	1.00	.10	2.00	30.35
Japan	1.73	1.94	3.57	3.46	34.02	2.17	3.10	.52	.32	2.25	53.07
Korea	1.21	1.02	3.74	3.22	35.15	2.00	2.40	.50	.30	2.00	51.55
Europe	1.39	1.88	3.50	3.32	37.39	2.13	3.18	.55	.21	2.45	56.00
Frenso-Bakersfield area:											
Group 201 mills	.83	1.81	3.19	2.44	14.51	.28	3.52	.77	.25	2.44	30.04
Group 200 mills	.92	1.66	3.38	3.12	14.67	.24	3.37	1.12	.19	2.24	30.92
Alabama and Georgia mills	.85	1.90	3.50	3.00	14.65	.15	4.15	1.00	.10	2.00	31.30
Japan	1.12	1.85	3.49	2.67	34.22	2.46	3.29	.55	.44	2.33	52.43
Korea	1.09	1.08	3.73	2.99	35.31	2.41	2.55	.49	.29	2.00	51.93
Europe	.78	1.54	3.57	2.37	38.70	2.67	3.53	.61	.32	2.50	56.58

[1] Commissions or comparable direct buying costs and local delivering expenses. [2] Receiving and outhandling and reweighing, resampling and other special services performed. [3] Domestic freight, ocean freight and, for some areas, wharfage, forwarding and controlling. [4] Marine and domestic insurance. [5] Includes hedging, interest and exchange. [6] Commissions or comparable direct selling costs. [7] Rejections and quality adjustments on sales, bad debts and fiber test fees. [8] Operating expenses not included elsewhere. [9] Excludes operating margins. Totals may not always add, due to rounding.

COMPETITIVE RELATIONSHIPS BETWEEN COTTON AND OTHER CROPS, BY REGION, 1976 and 1977

by
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ABSTRACT: Breakeven prices of cotton in the four major producing regions are calculated for 1976 and early 1977. The breakeven prices are compared with cotton farm prices to determine the direction of acreage adjustments in the regions.

KEYWORDS: Breakeven prices, acreage response, variable costs, cotton, soybeans, corn, sorghum, and barley.

INTRODUCTION

The rapid rise in farm production costs of recent years has significantly altered the competitive relationships between cotton and competing crops. Since variable costs are much higher for cotton than for its competitors, a general rise in production costs will reduce returns above variable costs for cotton relative to those for other crops, other things equal. Cotton now faces more intense competition in all regions than it did during the period of relatively modest cost increases. In addition, cotton yields have been below normal for the past three crops. This fact has further weakened cotton's competitive position.

Methodology

The prices of cotton required for cotton production to yield returns per acre above variable costs equal to those from competing crops were calculated by region for crop years 1976 and 1977. These "breakeven" prices of cotton are based on variable production costs reported in (1) and unpublished results for 1977 by the same authors. Fixed costs are ignored in the analysis since only short-run acreage adjustments are considered. The breakeven prices are based on average yields for the previous 3 years for all crops considered in the analysis. It was also assumed in calculating cotton breakeven prices that expected prices of competing crops were equal to average farm prices for the first 4 months of the calendar year.

Breakeven Price

The breakeven price[1] of cotton was calculated by the following formula:

$$(1)\quad BEPCT = \frac{(P)\,(Y) - VC + VCCT}{YCT}$$

Where

BEPCT = breakeven price of cotton, cents per pound

P = expected price of a competing crop

Y = expected yield of a competing crop

VC = variable production costs of a competing crop, dollars per acre.

VCCT = variable costs of cotton less ginning costs, dollars per acre.

YCT = expected cotton yield, pounds per acre.

REGIONAL ANALYSIS

Delta

The Delta region consists of Arkansas, Louisiana, Mississippi, Missouri, and Tennessee. In

[1]The concept of the breakeven price as used in this report *is not* the price for which returns from cotton are zero.

1976, the Delta accounted for about 34 percent of U.S. cotton acreage. Soybeans provide the most competition in the Delta, although rice may be a better alternative in some areas.

The breakeven price of cotton in 1976 was estimated at 46 cents per pound. Cotton farm prices averaged 53 cents per pound in the January-April period of 1976, and as a result of cotton's relative profitability and improved planting conditions, 1976 acreage increased 1.4 million to 4.1 million. However, the 1976 crop yielded only about 380 pounds per harvested acre, lowering yield expectations for 1977. In addition, soybean farm prices in December averaged about $6.56 per bushel in the Delta and appear to be on the rise. Soybean prices averaged $4.52 per bushel in early 1976. As a result, the breakeven price of cotton in the Delta in 1977 will be up sharply. However, cotton prices are also well above early 1976 levels—62 cents per pound in December versus about 53 cents in January-April.

Estimated cotton breakeven prices for the 1977 crop for different soybean price expectations are:

Soybean price/bu.	Breakeven price, cents/lb.
$6.50	65.1
$6.75	66.4
$7.00	67.7

While Delta cotton acreage will be primarily determined by price movements in the next 3 to 4 months and by weather conditions, the above analysis indicates that acreage may decline slightly in 1977.

Southeast

Cotton production in the Southeast is concentrated in Georgia, Alabama, and the Carolinas. Tobacco and peanuts are probably the most profitable alternatives in the region, but acreages are strictly controlled by allotments. Soybeans and corn provide the most competition. The proportion of cotton planted in the Southeast has declined by half in the past decade to only 8.3 percent in 1976, due mainly to the increasing breakeven price of cotton in the region.

The breakeven price of cotton in 1976, based on expected prices of $2.64 per bushel for corn and $4.54 per bushel for soybeans, was estimated to be 57 cents per pound. However, the breakeven price will rise in 1977 due primarily to much higher soybean prices. Farm soybean prices averaged about $6.60 per bushel in December 1976, more than $2 per bushel above early 1976 levels.

Cotton breakeven prices for 1977 for different soybean and corn price expectations are:

Soybean price/bu.	Corn price/bu.	Breakeven price, cents/lb.
$6.50	$2.25	62.7
$6.75	$2.35	64.1
$7.00	$2.45	65.6

In December, cotton farm prices averaged about 67 cents per pound in the Southeast. Early indications based on this analysis point to slightly higher cotton acreage in 1977. Even for the combination of $7 soybeans and $2.45 corn (corn averaged $2.30 per bushel in December in the Southeast), the cotton farm price could drop slightly from the December average and still compare more favorably with the breakeven price than it did in 1976. In the spring of 1976, cotton farm prices averaged about 2 cents per pound below the estimated breakeven price.

Southwest

About 44 percent of U.S. cotton acreage in 1976 was planted in Texas and Oklahoma, mostly in Texas. The Southwest is an area of low per unit returns where cotton competes primarily with grain sorghum.

The breakeven price of cotton in 1976, based on a $2.34 per bushel sorghum price, was estimated to be 47 cents per pound. Cotton farm prices averaged about 45 cents per pound in the first 4 months of the year. But the difference between the estimated breakeven price and the expected farm price was less than in 1975, and acreage increased moderately. Although cotton yield expectations (based on a 3-year average) are lower for 1977 than for 1976, the breakeven price will change little since sorghum prices may be slightly lower. In December, sorghum averaged about $2 per bushel for Southwest producers.

Cotton breakeven price estimates in 1977 for different grain sorghum price expectations are:

Sorghum price/bu.	Breakeven price, cents/lb.
$1.95	45.1
$2.10	47.6
$2.25	50.1

Cotton farm prices averaged 67 cents per pound in December in the Southwest. The analysis strongly indicates a large increase in cotton acreage in 1977.

West

The States of California, Arizona, and New Mexico planted 13½ percent of U.S. cotton acreage last year. Chief competing crops are barley, alfalfa, and wheat. Barley was selected as a representative crop for this analysis.

The breakeven price of cotton in 1976, based on barley prices of $2.70 per bushel, was estimated to be 39 cents per pound, well below cotton farm prices of about 57 cents per pound. Improved cotton yields in 1976 and expected lower barley prices will decrease the breakeven price in 1977. Barley farm prices in December 1976 averaged about $2.40 per bushel, down 30 cents from early 1976 levels.

Cotton breakeven price estimates for 1977 are:

Barley price/bu.	Breakeven price, cents/lb.
$2.30	35.0
$2.50	36.0
$2.70	37.0

Cotton farm prices averaged about 70 cents per pound in December 1976 in the West. The analysis suggests a significant increase in cotton acreage in the region as the gap between the expected farm price of cotton and the breakeven price widens.

SUPPORTING ANALYSIS

The breakeven price analysis allows one to estimate the likely direction of change in acreage from year to year. A more specific estimate may be made if we approximately know the effects on cotton acreage of changes in key variables such as the breakeven price of cotton, cotton farm prices, provisions of Government programs, and so forth. We have estimated the effects of these variables by applying regression analysis to data over the 1959-1976 time period. The estimated equation is quite complicated since the different cotton farm programs had to be accounted for. However, a simpler expression can be derived from the complete equation for a given farm program. For the target price program, the derived equation is:

(2) $A = 12{,}732 + 262\ PCT + 206\ DEF - 299\ BEPCT$

Where

A = Upland cotton planted acreage in thousands.

PCT = expected farm price of cotton, cents per pound.

DEF = expected deficiency payment, cents per pound (0 for 1974-76 and in all likelihood for 1977).

BEPCT = expected breakeven price of cotton, cents per pound.

The U.S. breakeven price of cotton is estimated to be about 57 cents per pound in 1977, up about 9 cents from 1976. The equation indicates that a cotton price increase of about 10 cents per pound is required to offset the effect on cotton acreage of the increase in the breakeven price. Stated otherwise, cotton farm price expectations of 61 cents per pound (U.S. average) are required. Through December 1976, U.S. cotton farm prices averaged about 65 cents per pound. If producers base their 1977 plantings on the 65 cents per pound price, cotton acreage is estimated to increase by slightly more than 1 million acres—to about 12.9 million. An increase of this magnitude was suggested by the breakeven price analysis which indicated an apparent wide advantage for cotton over competing crops in the Southwest and the West; a slight advantage in the Southeast; and, only a slight disadvantage in the Delta.

SUMMARY

Producers in early January indicated intentions to plant about 12.8 million acres of upland cotton, 10 percent above last year. Expansions of 27 percent in the West, 15 percent in the Southwest, and 9 percent in the Southeast were indicated. A decrease of 3 percent in Delta acreage was intended.

However, cotton prices have fallen in recent weeks. New crop futures (December contract) have declined about 3 cents per pound since January 1, 1977. While cotton will maintain its edge in the Western Cotton Belt—even with a greater price decline than that noted above—the total change in acreage depends heavily on price movements from now to planting time. If the lower prices received in January are maintained or if cotton prices slip further, acreage declines in the Delta and perhaps the Southeast from January intentions could nearly cancel the expected increases elsewhere.

REFERENCE

(1) *Costs of Producing Food Grains, Feed Grains, Oilseeds, and Cotton, 1974-76.* USDA, Agricultual Economic Report No. 338.

MARKET TRENDS AND MARGINS FOR COTTON DENIM

by
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ABSTRACT: Trends in the production of cotton denim fabric during recent years are presented. Results show that denim output increased substantially at the same time production of all cotton fabrics declined sharply. Also shown are estimated marketing margins and costs for denim dungarees during 1976, indicating the farmer's share of the retail dollar is about 8.8 percent. Shares received by other sectors are also presented.

KEYWORDS: Cotton denim, marketing costs, margins.

INTRODUCTION

Cotton producers, ginners, warehousemen, merchants, and textile mills have all received substantial benefits from the strong consumer demand in recent years for natural fibers and especially cotton denim products. During 1976, an estimated 1.1 million bales of cotton were consumed in the manufacture of cotton denim fabric, representing approximately 16 percent of cotton consumed in all end products. This market share is nearly double the amount only 5 years earlier.

The purpose of this article is to provide information showing the significant contribution of denim fabric to the overall demand for cotton fiber, and to estimate marketing margins and costs for denim dungarees—the primary consumer product made of denim. This information is useful in evaluating the total market for cotton and competing fibers, and for developing a better understanding of the effects of raw fiber costs on retail apparel prices.

MARKET GROWTH

Total Production

The growth in utilization of cotton denim is best illustrated by data showing the patterns of denim production over the past decade.

During 1965-69, cotton denim production generally followed the trend in textile mill production of all cotton broadwoven fabrics. For this period, denim's share of the total fabric market remained at approximately 3 percent (table 18). Although quarterly data are not shown for these years, denim's market share never varied more than from a low of 2.4 percent during the third and fourth quarters of 1965 to a high of 3.4 percent in the last quarter of 1969.

Beginning in 1970, however, the popularity of denim products began to grow and these products were soon accounting for an increasingly significant share of total textile mill consumption of cotton fiber. By the end of 1970, nearly 300 million linear yards of cotton denim were produced, representing about 5 percent of all U.S. output of cotton broadwoven fabrics. On a quarterly basis, denim production continued to show steady gains throughout the 1970-74 period, reaching about 10 percent of the total market in the fourth quarter of 1974. On an annual basis, denim production grew about 35 percent during the 5-year period while total production of all cotton fabrics fell by over 35 percent.

The year 1975 was by far the most significant year for the growth in production and

Table 18—Cotton broadwoven fabric production

Year and quarter	Total broadwoven fabric	Denim	Denim as a percent of total
	Million linear yards	*Million linear yards*	*Percent*
1965	9,237.8	257.8	2.8
1966	8,839.9	295.7	3.4
1967	8,278.1	264.3	3.2
1968	7,746.7	215.3	2.9
1969	6,964.9	222.4	3.2
1970			
1st	1,655.5	65.0	3.9
2nd	1,560.9	69.7	4.5
3rd	1,467.6	73.0	5.0
4th	1,562.0	87.8	5.6
Total	6,246.0	295.5	4.7
1971			
1st	1,607.2	91.5	5.7
2nd	1,608.0	79.8	5.0
3rd	1,405.2	71.2	5.1
4th	1,527.0	87.7	5.8
Total	6,147.4	330.2	5.4
1972			
1st	1,530.3	100.3	6.6
2nd	1,475.0	92.4	6.3
3rd	1,277.1	81.8	6.4
4th	1,383.5	85.6	6.2
Total	5,665.9	360.1	6.4
1973			
1st	1,376.8	88.4	6.4
2nd	1,323.6	84.7	6.4
3rd	1,159.5	85.7	7.4
4th	1,225.8	91.6	7.5
Total	5,085.7	350.4	6.9
1974			
1st	1,322.1	101.8	7.7
2nd	1,278.6	99.8	7.8
3rd	1,127.5	97.7	8.7
4th	985.4	100.4	10.2
Total	4,713.6	399.7	8.5
1975			
1st	901.5	143.0	15.9
2nd	978.0	160.4	16.4
3rd	1,050.8	145.3	13.8
4th	1,164.4	159.2	13.7
Total	4,094.7	607.9	14.8
1976			
1st	1,200.1	169.1	14.1
2nd	1,157.1	159.4	13.8
3rd	1,044.6	170.2	16.3

Bureau of the Census, Current Industrial Report, Series MQ22T.1

utilization of cotton denim. In the first quarter of 1975, production was up over 43 percent from the preceding quarter. And, by the end of the year, production had reached over 607 million linear yards—more than 52 percent above the annual production only a year earlier.

For the first 3 quarters of 1976, textile mill production of denim continued to expand. Output totaled nearly 500 million linear yards or about 50 million more than the year-earlier level, and is estimated to reach about 660 million for all of 1976 when final figures are available.

While the anticipated increase in production during 1976 is not as spectacular as increases the year before, the market for cotton in denim products shows no immediate sign of easing.

Production by Fabric Weight

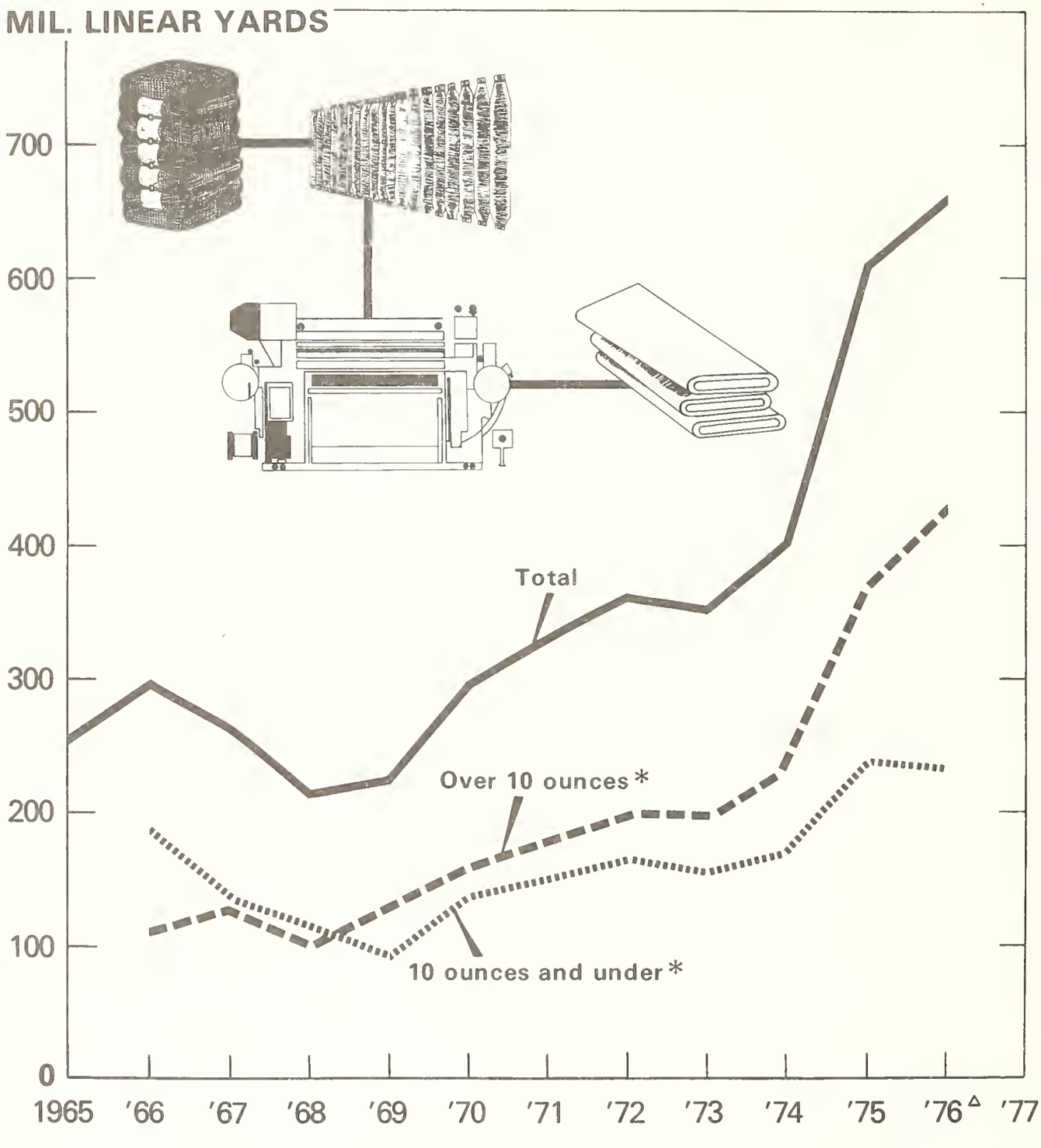
Most cotton denim can be divided into two major weight classes—heavy weight (over 10 ounces per square yard), and light weight (10 ounces per square yard and under). The heavy weight denim is primarily 13¾ ounce per square yard fabric used in the manufacture of dungarees and overalls. The light weight denim is mainly 7¼ to 10 ounce per square yard fabric, which may be referred to as dress denim and is used for such items as shirts, leisure suits, and skirts.

Trends in the level of production of these two fabric classes and for total denim production are shown in figure 9. While mill output of both the heavy and light weight denim generally increased over the past decade, beginning in 1970, the production of the heavy weight fabric began to increase more rapidly. By 1971, approximately 55 percent of all denim was over 10 ounces per linear yard. Thereafter, heavy weight denim continued to account for an increasingly significant proportion, reaching an estimated 70 percent by the end of 1976. This rapid growth, especially in the past 2 years, primarily reflects consumer acceptance and popularity of denim dungarees and jeans as an item of casual attire and not solely as work clothing.

Per Capita Rates

The rate at which consumers have turned to denim products is also shown by data on per capita production over the past 11 years. Figure 10 shows the increase in per capita rates from 1965 to 1976. Over this period, per capita production increased from 1.3 pounds to about 3.1 pounds per person, representing an increase of approximately 138 percent. At the same time, however, per capita consumption of cotton for all uses fell by nearly 32 percent. These rates do not reflect domestic consumption of imported cotton textile products which have been increasing rapidly at the expense of domestic production.

COTTON DENIM PRODUCTION, TOTAL AND BY FABRIC WEIGHT



△ *ESTIMATED.* ✱ *BREAKDOWN BY FABRIC WEIGHT NOT AVAILABLE FOR 1965.*

USDA

NEG. ERS 2682-77 (1)

Figure 9

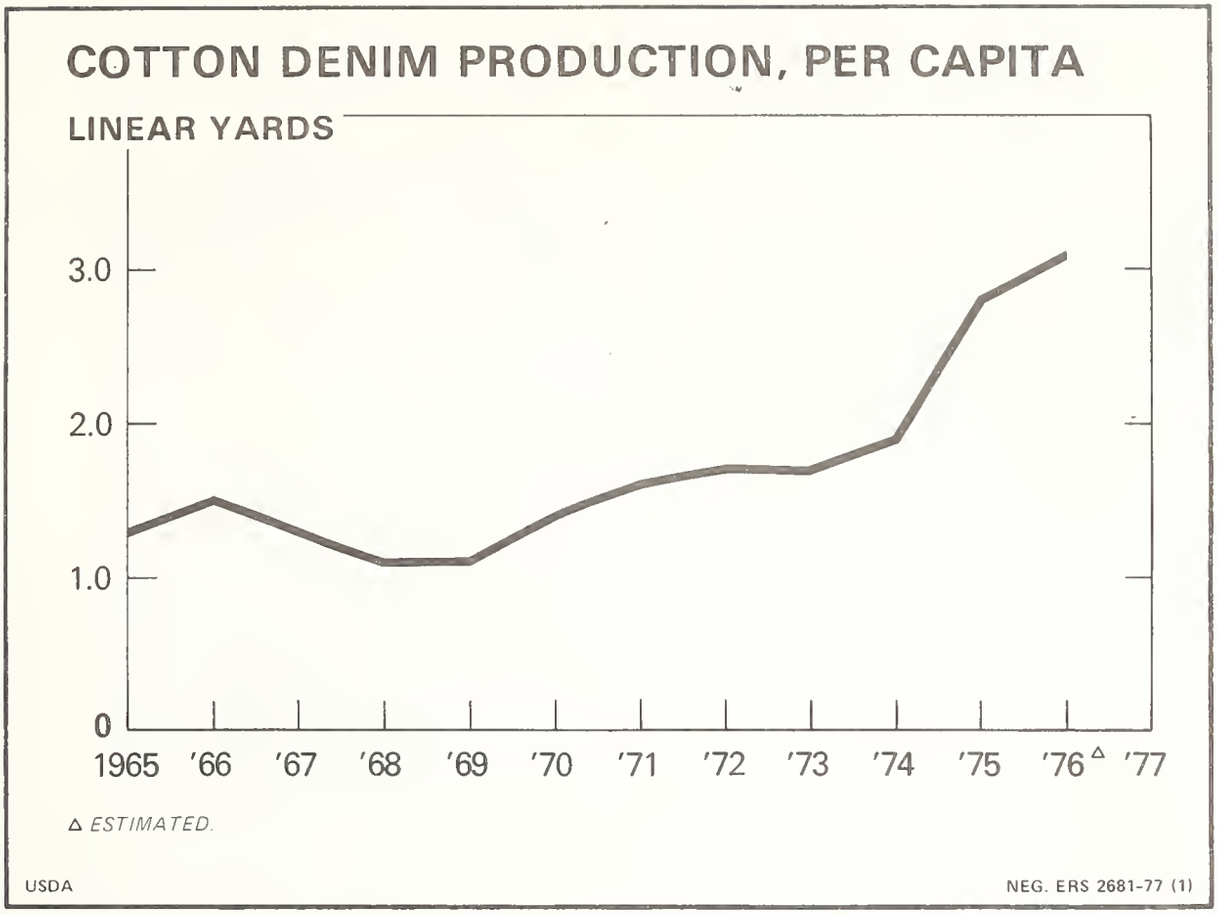


Figure 10

MARKETING MARGINS AND COSTS

The transition from a raw fiber to a finished consumer product on a retail shelf requires numerous physical operations and marketing services. Generally, as the number of operations and services beyond the farm gate increases, the spread between what the farmer receives for the raw fiber and the final retail value increases.

For cotton denim products, the retail price paid by consumers reflects the combined cost of the following; production, ginning and marketing raw cotton to mills, spinning and dyeing of the yarn, weaving fabric, apparel manufacturing and distribution, and displaying and merchandising in retail stores. Gross margins at each stage represent the difference between the cost of the input (raw fiber, yarn, fabric, etc.) and the value of the finished item as it goes to the subsequent stage. This value added at each stop between the farm gate and the retail counter is the farm-retail price spread.

Farm-Retail Spread for Denim Dungarees

The estimated retail value, farm value, and farm-retail spread for a typical pair of cotton denim dungarees is shown in table 19. In 1976, the farmer received about $1.14 for the cotton contained in a pair of dungarees with estimated retail value of $12.95, or approximately 8.8 percent of the retail price. The difference ($11.81), over 91 percent, was

Table 19—Cotton denim dungarees: Estimated retail value, farm value, and farm-retail spread, 1976[1]

Item	Value per pair	Proportion of retail value
	Dollars	*Percent*
Retail value[2]	12.95	100.0
Farm value[3]	1.14	8.8
Farm-retail spread	11.81	91.2

[1] Estimates are based on men's 100-percent cotton denim dungarees constructed of 13 ¾ ounce per square yard fabric, requiring 2.491 square yards per pair, or approximately 2.14 pounds of cotton. [2] Estimated from published and unpublished sources. [3] USDA average price received by farmers minus average charge for ginning the cotton.

accounted for by all associated marketing margins. Estimates for prior years have not been made as comparable data are not available. Farm value only includes the value of the net amount of cotton in the item and does not include any allowance for an approximate 10-12 percent manufacturing loss, nor for the sale of cottonseed by producers. Moreover, the ginning charges, which are paid by producers and are reflected in the average price received by farmers, have been deducted from the farm price and are shown later as a separate marketing cost.

Components of Farm-Retail Spread

The cost or value added to the pair of dungarees for all operations and services connected with wholesaling and retailing is estimated at $5.44—or by far the largest portion of the total farm-retail spread of $11.81 (table 20). This amount reflects the difference between the cost of the dungarees at the apparel manufacturer's level and the final retail selling price. Other costs associated with the production and marketing of cotton denim dungarees are also shown in the first column of table 20. They ranged from a low of about 12 cents for marketing the required raw cotton to textile mills to approximately $3.72 for styling, cutting, and sewing finished fabric into a pair of dungarees by apparel manufacturers.

The second column of the table shows these estimates on the basis of 1 pound of cotton after it leaves the farm gate. Thus, if each of the associated cost components were added to the farm price of 1 pound of cotton (after deducting ginning charges), the result would be an estimate of what that 1 pound is worth at the retail level when used in denim dungarees.

Table 20—Components of farm-retail spread for cotton denim dungarees, 1976[1]

Component	Cost per pair produced[2]	Cost per lb. of cotton used[3]
	Dollars	*Dollars*
Ginning	0.143	0.067
Marketing to textile mills	.118	.055
Warehousing services	(.024)	(.011)
Compression	(.017)	(.008)
Transportation	(.036)	(.017)
All other[4]	(.041)	(.019)
Textile mill processing and finishing	2.384	1.114
Apparel manufacturing	3.724	1.740
Wholesaling-retailing	5.440	2.542
Total farm-retail spread	11.809	5.518

[1] Costs for ginning and marketing to mills obtained from published U.S. Department of Agriculture reports; textile mill processing and apparel manufacturing estimates were adapted from data from the Bureau of Labor Statistics; and wholesale-retail margins estimated from private trade sources. Complete methodology and data sources are available on request. [2] Reflects the estimated cost of value added to a pair of denim dungarees containing 2.14 pounds of coton at each stage between the farm gate and the retail shelf. [3] Reflects the estimated cost or value added to one pound of cotton used in the manufacture of denim dungarees at each stage. [4] Includes buying and selling expenses, cotton insurance, financing, and overhead expenses of marketing firms.

Distribution of Consumer's Dollar

The estimated distribution of the consumer's dollar spent for a pair of men's cotton denim dungarees in 1976 is shown in figure 11. The farmer's share of the consumer's dollar for producing the cotton is about 8.8 cents. Cotton ginners receive a little over 1 cent for ginning, bagging and ties, and drying of seed cotton, while less than 1 cent goes to firms involved in marketing raw cotton to textile mills. Domestic textile mills who take the raw fiber and produce finished denim fabric account for about 18.4 cents of the retail dollar. Apparel manufacturers receive nearly 29 cents, while the largest share, about 42 cents, is for wholesaling and retailing functions and services.

The relative proportions of the consumer's dollar going to the various sectors of the economy is not necessarily a measure of the value or importance of any of the particular sectors. Each stage in the production-utilization process is dependent on each of the others and all are interdependent. Cost reductions and efficiencies in those sectors accounting for the larger shares, however, offer the greatest potential for reducing the spread between what the farmer receives for his fiber and the price paid by consumers for textile products.

IMPLICATIONS

The rapid increases in the production and consumption of cotton denim in recent years has come at a time when total cotton use has been falling. So, with denim currently accounting for about 16 percent of the total domestic cotton market, its importance should not be overlooked. All sectors of the cotton industry benefit substantially from the continuing popularity of this durable natural fabric. Each additional dollar spent by con-

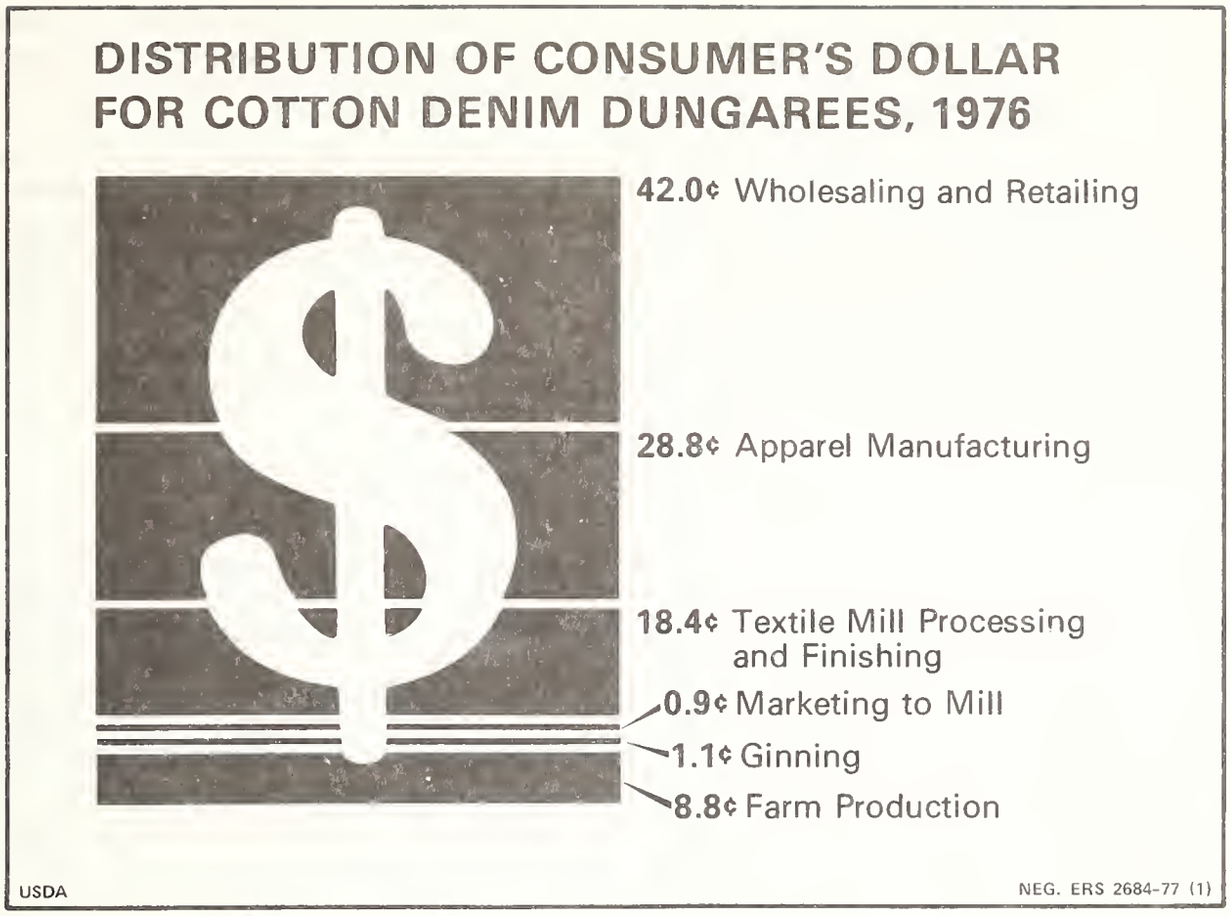


Figure 11

sumers for denim products is reflected back to the cotton industry as additional farm income, ginning receipts, and merchandising revenues.

However, with recent raw cotton prices well above prices for polyester fiber and prospects for continuing tight cotton supplies, many producers of 100-percent cotton denim fabrics are currently considering some substitution of manmade fiber for cotton. Those firms considering fiber substitution are hopeful that consumer acceptance of the high cotton content blended denims will be as strong as that for 100-percent cotton. Therefore, it is important that the domestic cotton industry make every effort to provide an adequate supply of raw cotton to mills at competitive and stable prices.

THE IMPACT OF COTTON TEXTILE IMPORTS ON THE DOMESTIC MARKET

by
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ABSTRACT: This study examines the recent dramatic growth in cotton textile imports, which now account for nearly a fifth of domestic cotton consumption. The impact on U.S. mill consumption of cotton is analyzed. Also, products mainly responsible for the recent growth in overall imports are pinpointed along with countries of origin.

KEYWORDS: Cotton textile imports, import penetration, domestic consumption, sheeting, and print cloth.

INTRODUCTION

U.S. imports of cotton goods, long an important component of domestic textile use, have taken on even greater significance in recent months. Imports will account for nearly a fifth of cotton products sold over retail counters this spring, up from around 13 percent a year ago and less than a tenth in 1965. This article analyzes this recent spurt in domestic demand for foreign-produced textiles, including the principal products involved, their countries of origin, and the impact on U.S. mill consumption of cotton.

Increasing cotton textile imports during the past year are directly tied to the recovery from the recent recession in textile activity in this country, demand for the natural look of 100-percent cotton fabrics, abundant supplies of cheaper foreign textiles, and somewhat limited domestic flexibility for manufacturing all-cotton products, particularly coarse yarn goods. The decline in the cotton broadwoven goods industry over the past 10 years reflects increased consumer demand for easy care fabric blends, coupled with more stable manmade fiber supplies and prices. This big shift to blends has sharply curtailed the desire of domestic textile mills to produce 100-percent cotton fabric. For instance, production of 65-percent polyester/35-percent cotton blends has more than tripled over the past decade, aided by sizeable manmade fiber industry promotional expenditures. However, a slightly different trend is now evident—increased demand for the casual look and feel of all-cotton products and higher cotton-content blends. There is also greater consumer dissatisfaction with synthetic double knits. Consequently, with this recent renewal in demand for cotton products, U.S. apparel and other textile product manufacturers have turned to foreign fabric suppliers, whose goods historically have been priced below U.S. products. Imports have gained despite the bilateral textile agreements which we maintain with a number of foreign countries.

TEXTILE TRADE AGREEMENTS

Several agreements have been negotiated during recent years to regulate international trade in textiles. Under the 1962 Long-term Textile Agreement, U.S. imports of cotton textiles could be restricted when domestic markets were threatened or subjected to disruption. However, certain provisions, such as a 5-percent annual growth factor and reciprocal agreements, provided for increased imports.

The Long-term Textile Agreement was replaced in January 1974 with the Arrangement Regarding International Trade in Textiles, or the Multifiber Arrangement (MFA), negotiated under the General Agreement on Tariffs and Trade (GATT). The MFA includes cotton, wool, and manmade fiber textiles and will expire at the end of 1977. Under the MFA, bilateral agreements are permitted to eliminate risks of textile market disruption in importing countries while ensuring the expansion and

orderly development of world trade. Section 204 of the Agricultural Act of 1956 empowers the United States to negotiate such arrangements. Currently, we have bilateral agreements with 18 countries.

Our most notable bilateral textile agreements are with Japan, South Korea, Hong Kong, and Taiwan. These 3-year multifiber agreements became effective in October 1974. As a result of shrinking exports to the United States in recent years, the Japanese agreement was recently amended to remove restraint levels on exports of cotton and manmade fiber textiles to the United States and establish a consultation/negotiation mechanism to handle market disruption complaints. The agreement with South Korea permits annual increases of 6.25 percent to 6.75 percent in their exports of specified items. Both the agreements with Hong Kong and Taiwan permit an overall 6.25 percent annual increase in exports to the United States.

Many of these countries have not been fully utilizing their quotas during recent years. So with ceilings increasing each year, U.S. imports of cotton textiles have been allowed to increase very sharply over the past year. There have also been sharply expanded shipments from non-quota countries, especially the People's Republic of China.

IMPORT PENETRATION

After increasing sharply in the early 1960's, imports of cotton textile products leveled off at around 1 million equivalent bales of cotton in the late 1960's and early 1970's. By comparison, exports of cotton textiles from the United States averaged about 0.5 million equivalent bales during this period (tables 15 and 16). The result was a net import textile trade balance of about 0.5 million bales annually (figure 10). However, the import balance has increased to an annual rate of about 0.8 million equivalent bales during recent months, reflecting larger imports and stable exports.

Perhaps the best measure of U.S. retail demand for cotton goods is domestic cotton consumption. This statistical series is obtained by adding the raw cotton equivalent of textile imports to the raw cotton consumed by U.S. mills and then subtracting the raw cotton equivalent of textile exports. As shown in figure 11, domestic cotton use declined about 3½ million bales between 1965 and 1975, reflecting both competitive losses to manmade fibers and relatively larger cotton textile imports. The share of the U.S. market garnered by imports jumped from 7.7 percent to 15.7 percent during the past decade. However, the annual data for 1975 mask the

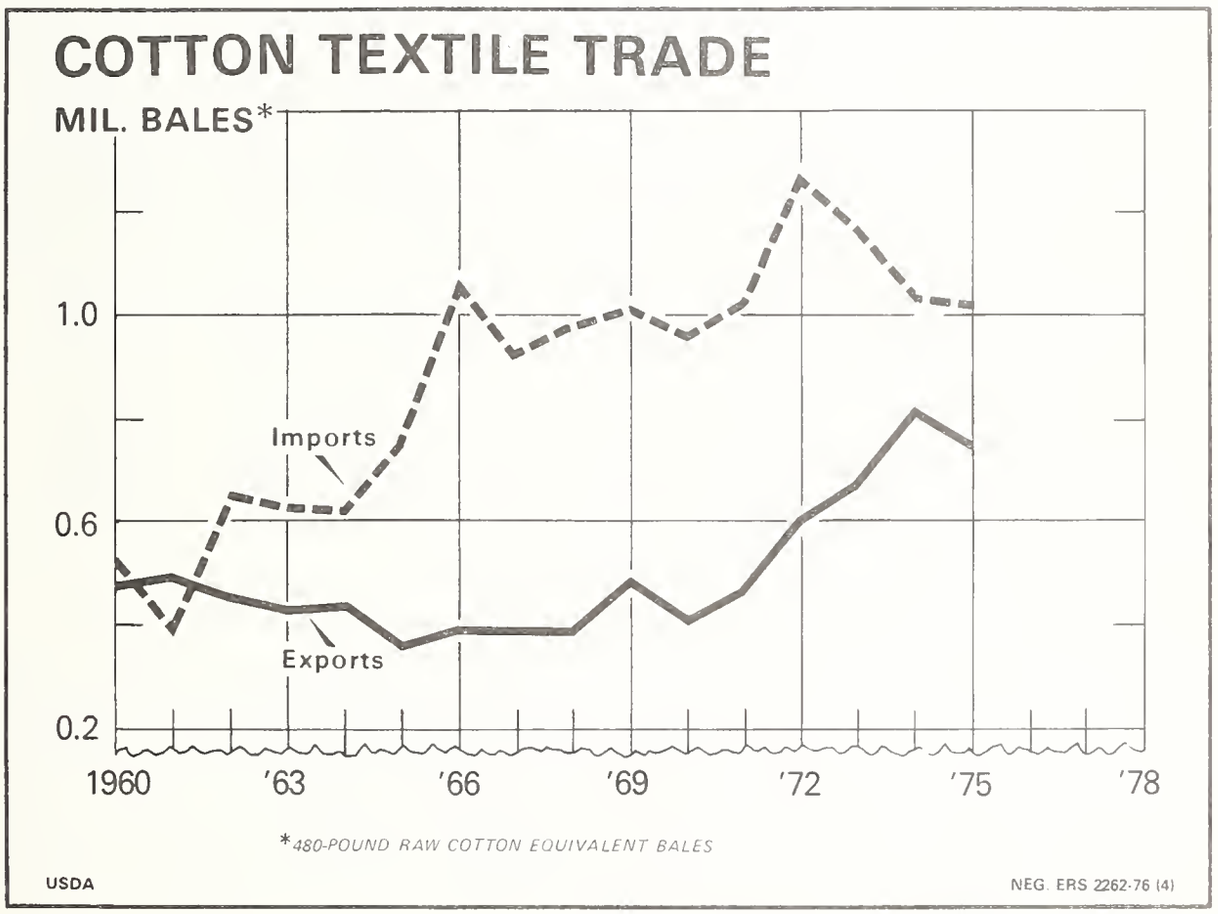

Figure 10

Table 15—Raw cotton equivalent of U.S. imports for consumption of cotton manufactures

Year and month	Yarn, thread, and woven cloth						Primarily manufactured products			
	Yarn	Sewing thread, crochet, knitting yarn	Woven cloth		Total		Pile fabrics and mfrs.[2]	Table damask and mfrs.	Bed-clothes and towels[3]	Gloves, hosiery, and hdkf.
			100 percent cotton	Blends[1]	Weight	Bales				
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bales*[8]	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1973	25,563	373	278,539	24,963	329,438	686.3	14,258	658	28,081	3,519
1974	13,025	336	246,105	13,375	272,841	568.4	7,609	495	31,258	4,885
1975[9]	11,334	341	215,007	7,117	233,799	487.1	4,305	267	21,195	5,252
1975[9]										
January	882	22	12,331	716	13,951	29.1	513	24	2,235	547
February	536	21	10,794	473	11,824	24.6	295	30	1,280	448
March	568	13	11,013	390	11,984	25.0	334	19	2,014	579
April	547	18	11,988	711	13,264	27.6	315	20	1,707	307
May	669	29	9,820	461	10,979	22.9	391	18	1,176	340
June	978	14	12,618	678	14,288	29.8	200	37	1,326	426
July	912	39	14,165	576	15,692	32.7	289	20	1,248	345
August	856	21	17,985	629	19,491	40.6	448	22	1,249	314
September	696	14	19,870	507	21,087	43.9	320	10	1,835	442
October	1,577	56	28,420	638	30,691	63.9	448	15	2,052	492
November	1,408	23	31,243	666	33,340	69.5	378	28	1,934	509
December	1,705	71	34,760	672	37,208	77.5	374	24	3,139	503
1976[9]										
January	2,032	35	33,071	1,177	36,315	75.7	718	10	2,961	649
February	2,371	32	25,349	1,495	29,247	60.9	247	17	2,850	599

Year and month	Primarily manufactured products							Total	
	Other wearing apparel[4]	Lace fabric and articles[5]	Household and clothing articles[6]	Misc.-products[7]	Floor covering	Total			
						Weight	Bales	Weight	Bales
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bales*[8]	*1,000 pounds*	*1,000 bales*[8]
1973	159,199	1,763	12,095	9,151	5,339	234,063	487.6	563,501	1,174.0
1974	163,425	1,749	10,126	6,859	3,432	229,838	478.8	502,679	1,047.2
1975[9]	216,063	1,550	10,412	4,686	2,048	265,778	553.7	499,577	1,040.8
1975[9]									
January	13,922	104	516	355	155	18,371	38.3	32,322	67.3
February	13,228	76	627	341	108	16,433	34.2	28,257	58.9
March	13,848	88	699	569	185	18,335	38.2	30,319	63.2
April	13,246	93	773	504	204	17,169	35.8	30,433	63.4
May	14,121	110	427	482	134	17,199	35.8	28,178	58.7
June	17,489	83	733	288	93	20,675	43.1	34,963	72.8
July	21,441	142	577	460	222	24,744	51.6	40,436	84.2
August	20,769	124	766	324	119	24,135	50.3	43,626	90.9
September	21,714	176	1,063	303	108	25,971	54.1	47,058	98.0
October	23,452	192	1,327	386	293	28,657	59.7	59,348	123.6
November	21,134	156	1,308	288	223	25,958	54.1	59,298	123.5
December	21,699	206	1,596	386	204	28,131	58.6	65,339	136.1
1976[9]									
January	22,532	175	1,324	446	283	29,098	60.6	65,413	136.3
February	22,423	151	1,085	310	123	27,805	57.9	57,052	118.9

[1] Includes tapestry and upholstery fabrics, tire cord fabrics, and cloths in chief value cotton containing other fibers. [2] Includes velvets and velveteens, corduroys, plushes and chenilles, and manufactures of pile fabrics. [3] Includes blankets, quilts, bedspreads, sheets and pillow cases. [4] Includes knit and woven underwear and outerwear (collars and cuffs, shirts, coats, vests, robes, pajamas, and ornamented wearing apparel). [5] Includes nets and nettings, veils and veilings, edgings, embroideries, etc., and lace window curtains. [6] Includes braids (except hat braids), tubing, labels, lacing, wicking, loom harness, table and bureau covers, polishing and dust cloths, fabrics with fast edges, cords and tassels, garters, suspenders and braces, corsets and brassieres, etc. [7] Includes belts and belting, fish nets and netting, and coated, filled, or waterproof fabrics. [8] 480-pound net weight bales. [9] Preliminary.

Compiled from reports of the Bureau of the Census.

Table 16—Raw cotton equivalent of U.S. exports of domestic cotton manufactures

Year and month	Yarn, thread, twine, and woven cloth							Manufactured products			
				Woven cloth		Total		Housing furnishings			
	Yarn	Sewing thread, crochet, darning, and embroidery cotton	Twine and cordage	Standard constructions and tire cord[1]	Other[2]	Weight	Bales	Blankets	Quilts, spreads, pillow cases, and sheets	Towels	Other[3]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bales*[8]	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1973	15,372	3,798	1,495	173,909	25,916	220,490	459.4	547	7,807	8,361	12,015
1974	17,926	4,325	1,762	201,500	29,599	255,112	531.5	690	12,344	10,647	15,703
1975[9]	11,958	3,336	1,702	188,529	28,859	234,384	488.3	662	11,164	8,380	11,668
1975[9]											
January	807	207	61	14,600	2,044	17,719	36.9	68	891	674	945
February	808	157	139	14,487	1,682	17,273	36.0	77	512	578	791
March	821	247	128	17,852	1,983	21,031	43.8	43	754	601	711
April	919	286	146	16,445	3,252	21,048	43.8	42	958	745	722
May	1,032	307	147	17,107	3,283	21,876	45.6	83	1,221	762	906
June	1,073	273	148	14,111	2,410	18,015	37.5	47	945	704	811
July	867	306	149	12,705	2,425	16,452	34.3	34	1,300	607	844
August	1,378	261	126	14,032	2,481	18,278	38.1	52	685	587	1,027
September	1,047	288	120	15,405	2,807	19,667	41.0	35	922	812	1,083
October	1,324	385	221	19,078	2,890	23,898	49.8	66	962	677	1,368
November	982	291	119	16,357	2,220	19,969	41.6	84	1,261	913	1,221
December	900	328	198	16,350	1,382	19,158	39.9	31	753	720	1,239
1976[9]											
January	1,110	364	207	16,704	2,160	20,545	42.8	44	1,116	567	917
February	1,071	374	196	16,713	1,603	19,957	41.6	61	827	567	1,198

Year and month	Manufactured products						Total	
	Wearing apparel		Other household and clothing articles[6]	Industrial products[7]	Total			
	Knit[4]	Other[5]			Weight	Bales	Weight	Bales
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bales*[8]	*1,000 pounds*	*1,000 bales*[8]
1973	5,166	24,751	26,138	19,922	104,707	218.1	325,197	677.5
1974	7,372	32,717	35,589	22,319	137,381	286.2	392,493	817.7
1975[9]	7,847	34,649	27,135	17,765	119,270	248.5	353,654	736.8
1975[9]								
January	529	1,939	1,929	1,241	8,216	17.1	25,935	54.0
February	501	2,120	1,957	1,352	7,888	16.4	25,161	52.4
March	503	3,146	2,516	1,349	9,623	20.0	30,654	63.9
April	812	3,602	2,083	1,637	10,601	22.1	31,649	65.9
May	536	2,628	2,595	1,433	10,164	21.2	32,040	66.8
June	594	2,325	2,316	1,459	9,201	19.2	27,216	56.7
July	701	3,239	2,062	1,402	10,189	21.2	26,641	55.5
August	613	3,058	2,028	1,580	9,630	20.1	27,908	58.1
September	757	3,333	2,432	1,832	11,206	23.3	30,873	64.3
October	737	3,564	2,862	1,634	11,870	24.7	35,768	74.5
November	754	3,099	2,120	1,496	10,948	22.8	30,917	64.4
December	810	2,596	2,235	1,350	9,734	20.3	28,892	60.2
1976[9]								
January	877	3,115	2,039	2,364	11,039	23.0	31,584	65.8
February	815	3,078	1,803	3,389	11,738	24.4	31,695	66.0

[1] Includes fabrics, tire cord and cloth for export to the Philippines to be embroidered and otherwise manufactured and returned to the United States. [2] Includes tapestry and upholstery fabrics, table damask, pile fabrics and remnants. [3] Includes curtains and draperies, house furnishings not elsewhere specified. [4] Includes gloves and mits of woven fabric. [5] Includes underwear and outerwear of woven fabric, handkerchiefs, and wearing apparel containing mixed fibers (corsets, brassieres, and girdles, garters, armbands and suspenders, neckties and cravats). [6] Includes canvas articles and manufactures, knit fabric in the piece, braids and narrow fabrics, elastic webbing, waterproof garments, and laces and lace articles. [7] Includes rubberized fabrics, bags, and industrial belts and belting. [8] 480-pound net weight bales. [9] Preliminary.

Compiled from reports of the Bureau of the Census

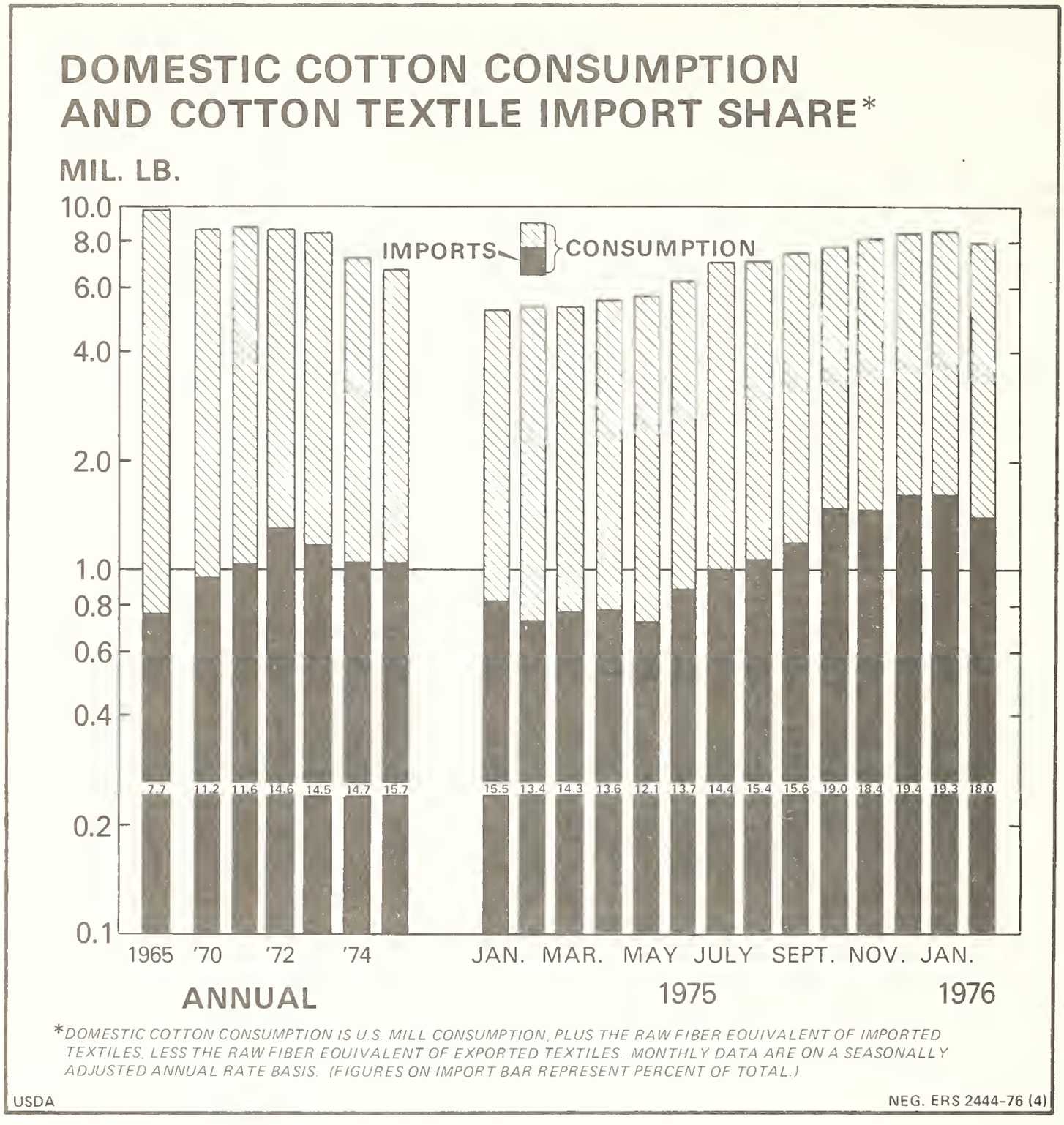

Figure 11

turnaround in demand for cotton products which got under way early in the year. They also hide the sharp import penetration late in 1975. Consequently, monthly data for 1975 and early 1976 are also shown in figure 11. These data reveal the extremely sharp recovery in cotton demand and show domestic cotton use during recent months well over 8 million bales on a seasonally adjusted annual basis. And even more important for the purposes of this study, an import penetration of close to one-fifth of the domestic market is revealed for recent months. During December-February, cotton textiles were imported into this country at a record annual rate of 1.6 million equivalent bales.

The doubling of cotton textile imports during the past year reflects a 69-percent gain in shipments of manufactured products (primarily wearing apparel) and a 148-percent increase in imported semi-manufactured goods (primarily cloth). Cotton cloth imports have

accounted for virtually the entire increase in overall shipments since mid-1975.

COTTON CLOTH IMPORTS

The primary cotton fabrics imported into the United States are duck, poplin, print cloth, sheeting, sateens, and twills. As shown in table 17, print cloth and sheeting imports have increased sharply over the past 8 months and account for most of the increase in cloth shipments. Imports of these two types of fabric during December-February averaged 15 million raw cotton equivalent pounds, more than 3 times last July's level.

Imports of cotton sheeting have increased dramatically over tha past decade. In 1975, these imports accounted for about a third of the domestic market for sheeting fabric, up from a tenth in 1965 (figure 12). The

Table 17—Cotton cloth imports[1]

Cloth category	1975						1976		February/ July ratio
	July	August	September	October	November	December	January	February	
	1,000 pounds[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	*1,000 pounds*[2]	
Duck	1,855	2,560	1,994	2,730	3,930	3,506	3,723	3,027	1.6
Poplin	93	268	280	772	682	277	385	235	2.5
Print cloth	807	275	2,608	4,063	5,161	4,951	3,500	3,236	4.0
Sheeting	3,884	4,552	4,501	7,881	9,033	12,747	11,923	8,790	2.3
Sateens and twills	5,143	7,268	7,887	8,839	8,434	8,454	7,435	4,999	1.0
Other cloth	2,383	3,062	2,600	4,135	4,003	4,825	6,105	5,062	2.1
Total cloth	14,165	17,985	19,870	28,420	31,243	34,760	33,071	25,349	1.8

[1] 100-percent woven cotton cloth. [2] Raw cotton equivalent.

Bureau of the Census.

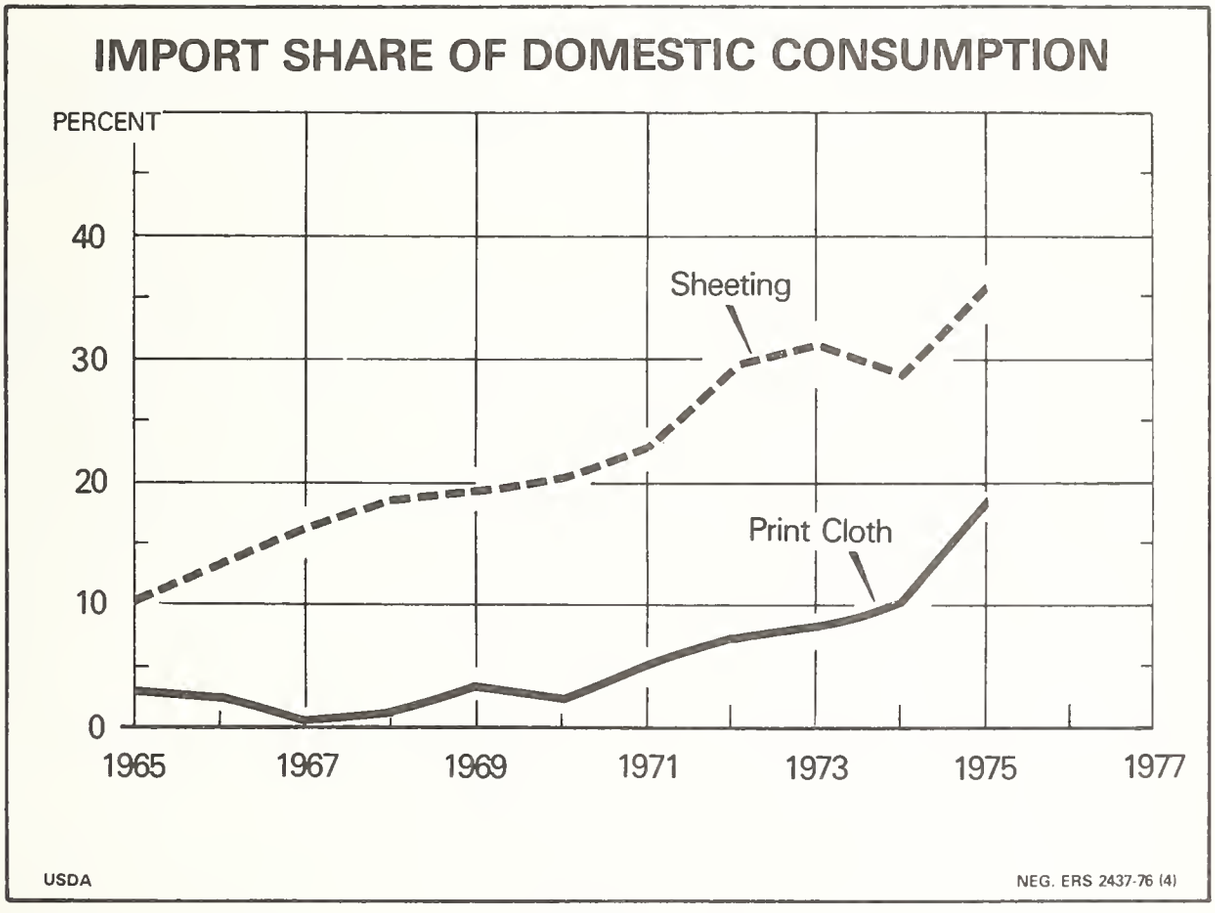

Figure 12

import penetration reached 43 percent in the fourth quarter of last year. U.S. production of 100-percent cotton sheeting has fallen off by over half in recent years, reflecting a substantial shift in looms to blended fabric.

Likewise, cotton print cloth imports are capturing a larger share of the domestic market. The import penetration in 1975 averaged 16 percent, compared to only 3 percent in 1965 (figure 12). In the fourth quarter of 1975, imports accounted for 35 percent of the domestic print cloth market.

The People's Republic of China (PRC) currently is the largest supplier of imported print cloth (figure 13).

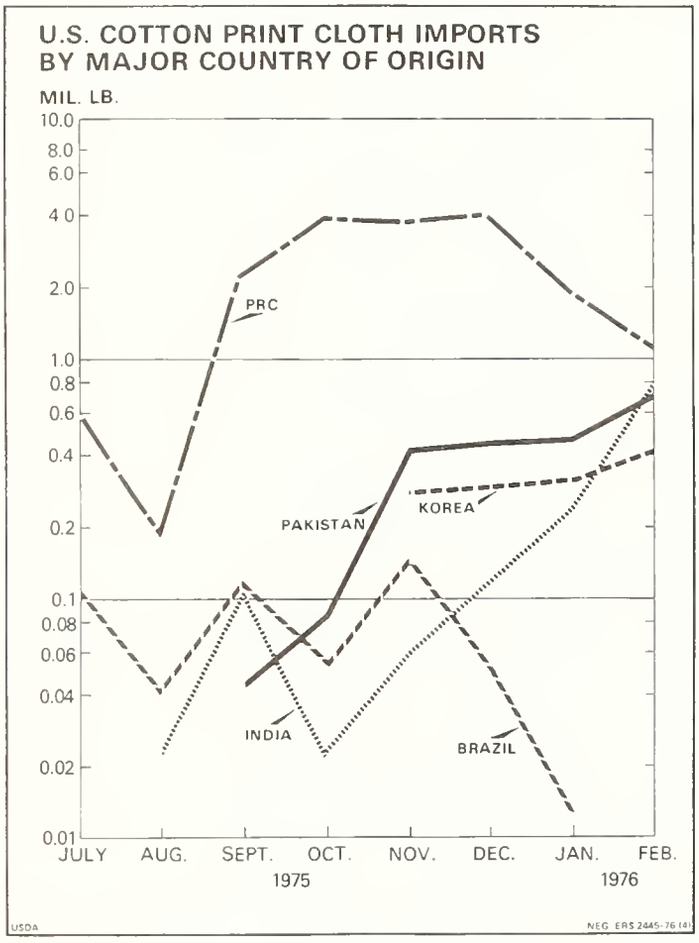

Figure 13

However, shipments have leveled off in recent months after increasing sharply last fall. Other significant countries of origin include Pakistan, South Korea, India, and Brazil.

The PRC also is one of the leading foreign sources for sheeting imports. Shipments from this non-quota country have jumped sharply since mid-1975. Imports from other countries, notably Taiwan, Hong Kong, and Pakistan, have also trended up during this period (figure 14).

Recent sheeting and print cloth imports from the PRC have been competitively priced, both with U.S. imports from other countries and with domestically produced fabric. However, this situation is in marked

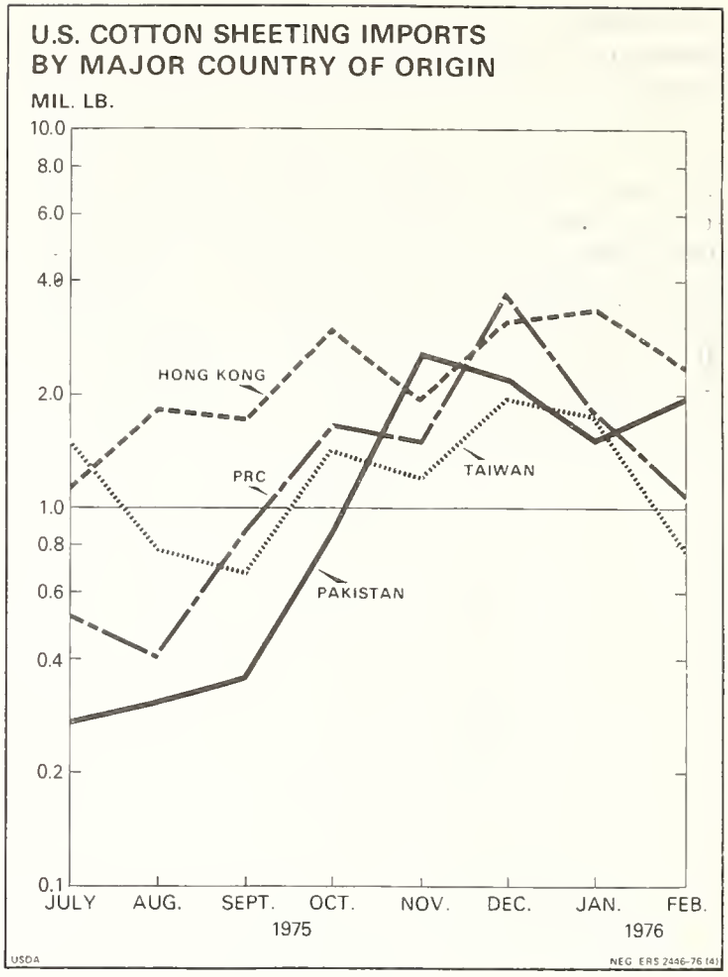

Figure 14

contrast to the cheaper imports of earlier years and may foreshadow some cutback in imports in coming months.

DOMESTIC IMPACT

Increasing cotton textile imports have substituted for potential U.S. mill consumption of raw cotton. Consumer demand today for cotton products, as measured by domestic consumption, is at the highest level since 1972 when 8.7 million equivalent bales of raw cotton were used and imports accounted for less than 15 percent of the market. However, imports are now capturing close to 20 percent of the domestic market and monthly U.S. mill consumption is running at an annual rate of around 7.3 million bales. This translates into an apparent reduction in mill use of about 400,000 bales, most of which has occurred since mid-1975. In other words, 1975/76 U.S. mill consumption would total closer to 7.7 million bales if today's import share approximated that which occurred between 1972 and mid-1975. Of course this observation assumes that domestic textile mills had the ability and incentive to increase production. It should also be pointed out that much of the raw cotton used to make textile products imported into this country was originally produced on U.S. cotton farms.

The level of U.S. cotton textile imports during the balance of 1976 will depend on several factors. Domestic demand at the consumer level will be a key variable. But perhaps just as important will be the price competitiveness of domestic and foreign-produced textile products. Although foreign goods have maintained their price advantage over U.S. products during recent years, the price differential has narrowed significantly in recent months. This situation indicates that buyers of cotton fabrics will switch from imports to domestically produced fabrics later this year if supplies are available and if prices for imports continue to rise. The slight decline in February textile imports may reflect such a switch.

On the other side of the coin, U.S. supplies of raw cotton promise to tighten considerably in coming months. As a result, the availability of American-produced cotton products may not be adequate to satisfy consumer demand, thus resulting in an increased need for foreign textiles.

The net result of this situation surrounding prices and supplies of textile products may first be a decline in U.S. imports during the next few months because of more competitively priced U.S. produced goods, followed by increased demand by the end of the year as U.S. supplies shrink.

GIN INVESTMENT COSTS IN THE UNITED STATES

by
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ABSTRACT: The cost of erecting a new gin plant has increased to more than $1.5 million, up from $250,000 a decade ago. Much of this increase can be traced to technological developments in the integrated processing and materials handling line. These developments have resulted in increased rates of ginning and potential cost savings through reduction in labor requirements. Estimated capital requirements range between $422,000 for a 7-bale per hour plant in the machine-picked region to nearly $1.8 million for a 35-bale per hour plant in the machine-stripped region.

KEYWORDS: Cotton, gins, investment.

INTRODUCTION

In recent years, the cost of erecting a new gin plant has increased at an alarming rate. A decade ago, an expenditure of $250,000 for the construction of a single-battery gin was common. Today, larger and more elaborate plants costing over $1.5 million are being built. To provide the service demanded by producers, ginners are increasingly being forced to install and utilize more sophisticated ginning machinery. Producers are demanding faster ginning rates and more effective machinery to increase the value of their product. Greater use of this machinery has been accompanied by a rise in the general price level; hence, not only do modern gins require more machinery, but the cost of each capital item in the ginning array has increased. Economics demands the consideration of new gin construction. Renovation is also an alternative that should be considered.[1]

The purpose of this analysis is to develop investment costs of gin plant buildings, machinery, and related equipment. Investment costs for 5 gin sizes ranging in 7-bale increments from a 7-bale per hour plant to a 35-bale per hour plant are considered.

Capital investment requirements vary between the Oklahoma-West Texas area where cotton is machine stripped and the other areas of the Belt where cotton is machine-picked. Because machine-stripped cotton contains more trash, investment requirements for this area exceed those of other areas. Accordingly, the areas merit separate discussion.

Recent technological developments in ginning have resulted primarily in increased rates of ginning and potential cost savings through reduction in gin labor requirements. An alternative to the inefficient traditional method of unloading seed cotton by raising it pneumatically with conventional telescopes now exists. Modules can now be unloaded by a conveyer system or the module can be dumped into the ginning stream. Trailers can also be raised and the cotton dumped into the ginning stream. The acceptance of the universal density press and improved bale packaging methods are also recent advancements. Other ginning innovations such as the automatic sampling and automatic strapping are gaining in popularity.

Recent improvements in the integrated processing and materials handling line of the conventional stripper gin have made possible the replacement of four machines. A stripper and an airline separater have replaced the airline cleaner, green boll trap, bur machine, and stick machine.

[1] For a discussion of the breakeven volume required to replace a modified flat bale press with a universal density press, see Ghetti, Joseph L. and Dale L. Shaw, "Costs and Breakeven Volumes for Universal Density and Modified Flat Bale Presses," *Cotton and Wool Situation*, CWS-5, ERS, USDA, May 1976.

CAPITAL REQUIREMENTS

The estimated capital requirements presented in table 16 indicate an investment ranging between $422,000 for a 7-bale per hour plant in the machine-picked regions to nearly $1.8 million for a 35-bale per hour gin in the machine-stripped region. With respect to each gin size, total investment is greater in the machine-stripped region. For each plant size, this difference is in the cost of gin machinery. The higher ratio of trash to lint resulting from the machine-stripping operation requires gin plants in the Oklahoma-West Texas area to have more and larger machinery for materials handling and extracting.

Gin machinery is the single largest cost item in new plant construction and represents well over half the total capital investment. In cost estimates developed for the five model gin plants, machinery cost ranged between 57 and 67 percent of total investment costs in the machine-picked region and between 60 and 68 percent in the Oklahoma-West Texas region. Estimated machinery costs for Oklahoma-West Texas models are $18,800 to $36,300 higher than those for other regions. Machinery costs in each region range from about $250,000 to over $1.1 million.

Only the two largest gin plants, 28- and 35-bale per hour facilities, are fully automatic, given present technology.[2] With the exception of the unloading system, all machinery in the 21-bale per hour plant is automatic. Modern automatic equipment is not specified for the two smallest plant sizes because of inadequate volume. Further, a modified flat bale press is specified for 7- and 14-bale per hour plants while all other operations include a universal density press.

Gin building costs, constant for the same plant size between regions, represent 24 to 28 percent of the total capital outlay and range between $118,000 and $434,000. Much of this cost goes for the concrete foundation, which must be sufficiently strong to withstand vibrational stresses induced by heavy ginning equipment operating at high speeds. The cost of electrical wiring is also an important item included in this category.

Costs of outside equipment, including cyclones, piping, and a seed hopper, range between $30,000 for the smallest plant and $107,000 for the largest plant. However, two seed hoppers are specified for the largest plant. These costs represent from 5 to 7 percent of the total capital requirements.

The cost of office buildings and equipment, depending on plant size, varies between nearly

[2]Technically, the facilities are not fully automatic as labor is required to operate some pieces of equipment and to monitor the operation of others.

Table 16—Estimated capital requirements for model gin plants, by rated capacity, capital item, and harvest method, United States

Harvest method and capital items	Bale capacity per hour				
	7	14	21	28	35
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Machine picked:					
Land[1]	12.0	14.0	18.0	20.0	30.0
Gin buildings[2]	118.0	160.0	295.0	332.5	434.5
Gin machinery[3]	247.5	358.0	675.0	916.5	1,123.5
Outside equipment[4]	30.0	44.0	58.5	76.5	107.5
Tools	2.0	3.0	4.0	5.0	6.0
Office buildings and equipment[5]	12.6	12.6	17.6	17.6	29.4
Total	422.1	591.6	1,068.1	1,368.1	1,730.9
Machine stripped:					
Land[1]	12.0	14.0	18.0	20.0	30.0
Gin buildings[2]	118.0	160.0	295.0	332.5	434.5
Gin machinery[3]	266.3	376.8	711.3	952.8	1,159.8
Outside equipment[4]	30.0	44.0	58.5	76.5	107.5
Tools	2.0	3.0	4.0	5.0	6.0
Office buildings and equipment[5]	12.6	12.6	17.6	17.6	29.4
Total	440.9	610.4	1,104.4	1,404.4	1,767.2

[1] Estimated at $1,000 per acre. [2] Includes foundation. [3] Down packing press in 7- and 14-bale per hour plants; UD press, dual head automatic strapping, automatic sampler, and automatic bagging system for 21-bale per hour plants; conventional telescopes and bulk unloader, UD press, dual head automatic strapping, automatic sampler, and automatic bagging system for 28-bale per hour plant; conventional telescopes and bulk unloader, UD press, quad head automatic strapping, automatic sampler, and automatic bagging system for 35-bale per hour plant. [4] Includes cyclones, piping, and seed hopper. [5] Includes furniture, fixtures, and scales.

$13,000 and $29,000, but represents only 1 to 3 percent of the total investment. Component tools account for less than one-half of 1 percent of capital requirements in all models.

Careful planning of land requirements is necessary in selecting a gin site. Acreage needs will vary depending on whether baled lint is to be moved directly to the warehouse.[3] Estimated land investment varies between $12,000 and $30,000, or 1 to 3 percent of capital investment, depending on plant size (table 16).

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[3]For a discussion of gin plant yard plans, see *Handbook for Cotton Ginners*, Agricultural Handbook, No. 260, ARS, USDA, February 1964.

THE DECADE AHEAD FOR U.S. SOYBEANS *

by

Duane Hacklander[1]

ABSTRACT: U.S. soybean production is projected to increase 20 percent from 1975 to 1,835 million bushels by 1985, despite increased competition from Brazilian soybeans and rising palm oil imports. Exports, especially in the form of beans, are projected to increase during the next decade. Domestic food fats and oils consumption is expected to increase with soybean oil maintaining its position of the total. During the next 10 years, demand for livestock and poultry products is expected to rise, boosting demand for soybean meal as a livestock and poultry feed.

KEYWORDS: Soybeans, meal and oil projections.

After a long period of steady expansion, the U.S. soybean economy since 1973 has been undergoing major fluctuations as a result of a poor growing season in 1974, increased competitive pressures, and depressed levels of economic activity in both domestic and foreign markets. The purpose of this study is to update previous ERS studies and to extrapolate the future of the U.S. soybean industry to 1985.[2]

Assumptions

Most of the assumptions underlying this analysis are stated in the discussion. Other major assumptions include:

1) U.S. population is projected to be 236 million in 1985 according to Census projections.

2) U.S. per capita disposable income (in 1985 dollars) is projected to grow 2.7 percent per year from 1974 to 1985.

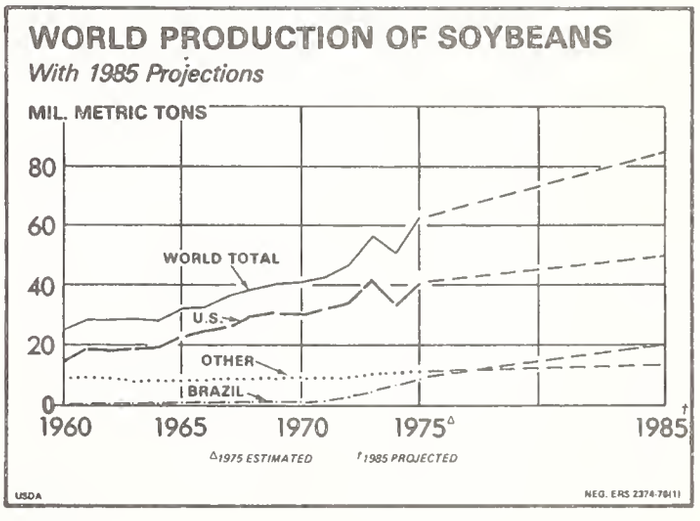
3) Beginning and ending stock levels in 1985 will be offsetting.

4) The proportion of domestic soybean oil disappearance for nonfood use will remain fairly constant.

World Soybean Production

World soybean production more than doubled between 1960 and 1975 from 25.1 million metric tons to 62.7 million metric tons. By 1985, world production of soybeans is expected to be about 85 million metric tons. This assumes a modified continuation of trends and basic policies around the world and that international trade will be restricted somewhat by national economic policies.

U.S. soybean production accounted for 73 percent of the world total as recently as 1973. But with the emergence of Brazil as a major soybean producer, the U.S. proportion of world soybean production has already fallen to two-thirds of world production and may be less than 60 percent by



* The author is indebted to Allen Smith, NEAD, and Arthur Coffing, FDCD, for input provided for this study.

[1]Agricultural Economist, Commodity Economics Division, Economic Research Service, USDA.

[2]Re-evaluation of prospective demand conditions largely account for the difference in production projections from an earlier ERS analysis published in the January 1976, *Farm Index*.

1985. Soybean production in Brazil increased sharply from 1.6 percent of the world total in 1968 to 15 percent in 1975. By 1985, Brazil is expected to be producing about one-fourth of the world's soybeans.

Domestic Soybean Production

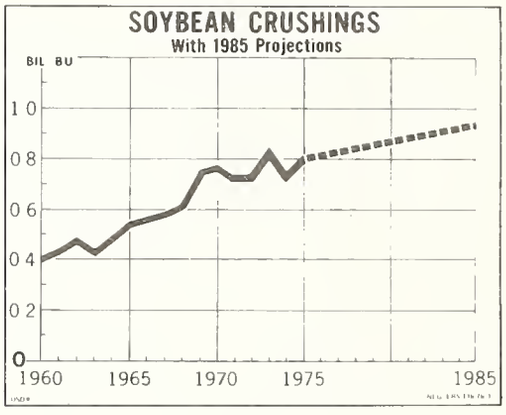
Domestic soybean production increased from 555 million bushels in 1960 to 1,521 million bushels in 1975. During the same period, annual yields per acre increased only about one-third of a bushel, while harvested acreage more than doubled from 23.7 million acres to 53.6 million acres. Thus, most of the expansion in soybean production resulted from the increase in acreage harvested.

In the next decade soybean production is expected to expand to 1,835 million bushels (50 million metric tons), with most of the increase still coming from increased soybean acreage. Harvested acreage by 1985 is projected at 60.7 million acres. In late 1973, ERS projected U.S. production capacity for soybeans at 64.5 million acres in 1985 (*Farm Index*, Dec. 1973). Current projected harvested acres are well within the capacity indicated by the 1973 study.

Yields per acre are expected to increase about one-fourth bushel annually to 30.25 bushels per acre by 1985. This assumes no major breakthrough in yields will occur. Other factors considered in the yield projections were the possibility of a commercially available high-yielding hybrid, a gradual shift to a greater production of soybeans in areas where yields are traditionally somewhat below the U.S. average, and, correspondingly, the possibility of more double cropping which would restrict yield increases.

Soybean Crushings

Soybean crushings more than doubled between 1960 and 1973. From the record high 1973 level, crushings declined sharply in 1974 and then rose to the second highest level in 1975 of 800 million bushels. In 1985, 935 million bushels (25 million metric tons) of soybeans are projected to be crushed. With estimated processing capacity for 1975 at 1,100 million bushels, little additional expansion would be needed to handle the 1985 level other than shifting to meet regional changes in production and demand.



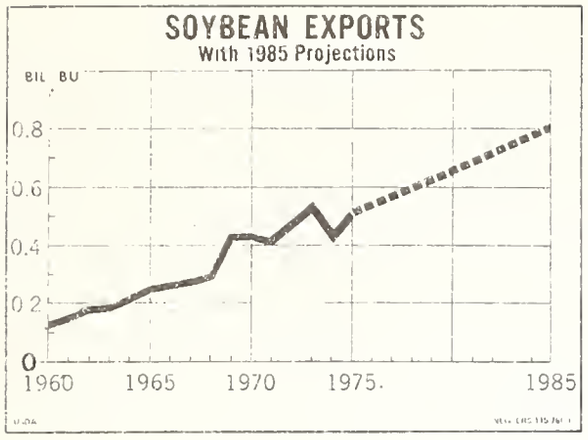
Soybean Exports

Worldwide demand for oilseeds and vegetable oil will continue to grow. Rising incomes should lead to diet changes including shifts to more meat and poultry products and to processed salad and cooking oils. Increased meat and poultry production, in turn, generates a higher demand for high-protein feed and thus soybean meal.

Soybeans: U.S. acreage, supply and disposition, crop years, 1960, 1965, 1970, 1973-75 and projection for 1985

Year beginning September	Unit	1960	1965	1970	1973	1974	1975[1]	1985[2]
		Acreage and yield						
Acreage:								
Planted	Mil. ac.	24.4	35.2	43.1	56.7	53.5	54.6	62.0
Harvested	Mil. ac.	23.7	34.4	42.2	55.8	52.4	53.6	60.7
% harvested	Pct.	97	98	98	98	98	98	98
Yield per acre harvested	Bu.	23.5	24.5	26.7	27.7	23.2	28.4	30.25
		Supply and disposition						
Supply:								
Beginning stocks	Mil. bu.	52	30	230	60	171	185	155
Production	Mil. bu.	555	846	1,127	1,547	1,215	1,521	1,835
Total supply	Mil. bu.	607	876	1,357	1,607	1,386	1,706	1,990
Disposition:								
Crushing	Mil. bu.	406	537	760	821	701	800	935
Seed	Mil. bu.	33	43	48	56	59	76	100
Other	Mil. bu.	6	9	16	20	20		
Total domestic disappearance	Mil. bu.	445	589	824	897	780	876	1,035
Exports	Mil. bu.	135	251	434	539	421	500	800
Total disposition	Mil. bu.	580	840	1,258	1,436	1,201	1,376	1,835

[1] Preliminary. [2] Projected. Acreage and production derived from projected demand and assumed yields per acre. Stock levels projected to equal 1 month's total requirements.



The major thrust in commercial exports is projected to be in the form of beans as crushing capacity continues to increase in the importing countries. Soybean exports from the United States are projected to increase to 800 million bushels (22 million metric tons) by 1985. This increase of about 300 million bushels from 1975 is projected despite the anticipated rapid increase in Brazilian soybean production and exports.

Soybean Meal

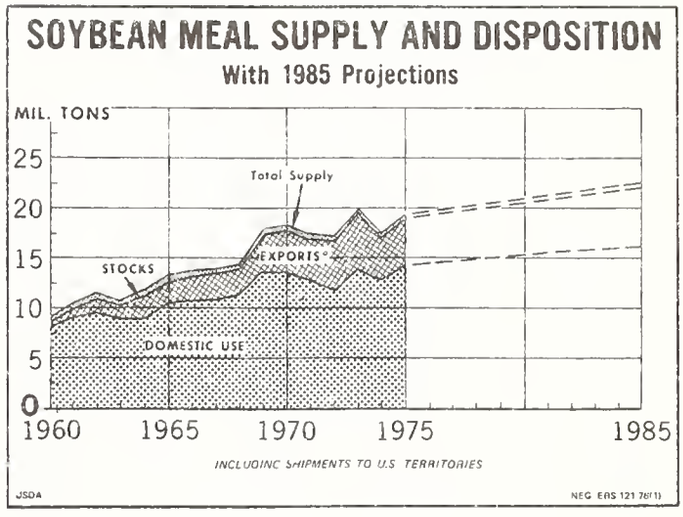
Since soybeans yield high amounts of protein, meal demand is the key factor in determining the domestic crush. Demand for meal is largely determined by the high-protein feed demand for livestock and poultry. The following table indicates projected production of meat, eggs, and milk that will contribute to the projected meal demand. Feeding rates are assumed to remain fairly constant during the next decade.

Soybean meal production increased from 9.5 million tons in 1960 to an estimated 19 million tons in 1975. By 1985 meal production is expected to increase by 3 million tons to around 22 million tons. Most of the expansion will likely come from increased domestic demand for high-protein feed. Meal exports are expected to increase only slightly, perhaps to around 6 million tons by 1985. Most of the anticipated demand for U.S. soybean meal exports will be met by soybean exports.

Meat, egg, and milk production

Item	Unit	1972-74 average	Projected 1985
Beef and veal[1]	Million pounds	22,699	30,000
Pork[1]	Million pounds	13,241	14,590
Lamb and mutton[1]	Million pounds	507	310
Chickens[2]	Million pounds	8,853	10,660
Turkeys[2]	Million pounds	1,920	2,450
Eggs	Million dozen	5,610	5,640
Milk[3]	Mil. cwt.	1,169	1,180

[1] Carcass weight. [2] Ready-to-cook basis. [3] Fresh equivalent.



Soybean Oil

Food fats and oils utilized in the U.S. increased from 8.3 billion pounds in 1960 to 11.1 billion in 1975. With an expected rise in per capita use plus population growth, food fats and oils use by 1985 may be slightly over 13.5 billion pounds.

Since 1960 a definite shift from animal fats to vegetable oils has occurred. The shift is expected to continue and by 1985 only about 17 percent of the

Soybean meal: Supply and disposition, crop years, 1960, 1965, 1970, 1973-75 and projection for 1985

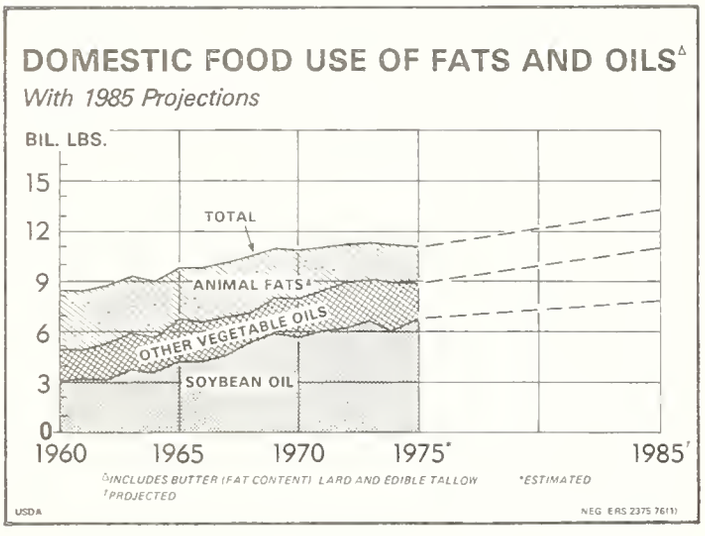
Year beginning October	1960	1965	1970	1973	1974	1975[1]	1985[2]
	1,000 tons	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Supply:							
Beginning stocks	83	106	137	183	507	358	225
Production	9,452	12,901	18,035	19,674	16,702	18,842	22,205
Total supply	9,535	13,007	18,172	19,857	17,209	19,200	22,430
Disposition:							
Domestic use[3]	8,867	10,219	13,406	13,766	12,502	14,150	16,135
Exports and shipments	590	2,656	4,620	5,584	4,349	4,550	6,070
Total disposition	9,457	12,875	18,026	19,350	16,851	18,700	22,205

[1] Preliminary. [2] Projected. [3] Includes animal feeds and edible soy products.

Food fats domestic use

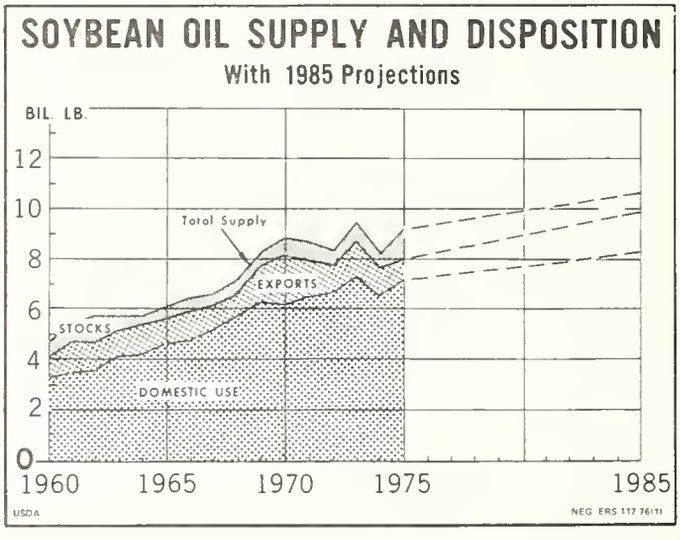
Item	1960	1965	1970	1973	1974	1975[1]	1985[1]
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
Soybean oil	2,989	4,218	5,780	6,748	6,070	6,696	7,905
Other vegetable oil	1,856	2,447	2,083	2,279	2,735	2,244	3,409
Animal fats[3]	3,458	3,146	2,984	2,382	2,312	2,130	2,357
Total (fat content)	8,303	9,811	10,847	11,409	11,117	11,070	13,671
Percentage distribution:							
Soybean oil	36.0	43.0	53.3	59.2	54.6	60.5	57.8
Other vegetable oil	22.4	24.9	19.2	19.9	24.6	20.3	24.9
Animal fats	41.6	32.1	27.5	20.9	20.8	19.2	17.3

[1] Estimated. [2] Projected. [3] Butter, (F.C.), lard, edible tallow.



total domestic food fats and oils will be animal fats. Soybean oil rose from 36 percent of the total in 1960 to about 60 percent in 1975. Soybean oil is projected to maintain its dominant position and represent about 58 percent of the total food fats and oils in 1985. Other vegetable oils will continue to replace animal fats. In particular, palm oil imports have increased sharply since 1970 and are expected to account for even more of the other vegetable oil portion by 1985.

U.S. soybean oil production is projected to be slightly more than 10 billion pounds (4.6 million metric tons) by 1985. Most of the oil will be used domestically as a food fat, but an estimated 1.6 billion pounds are expected to be exported. As in the past, some of the oil will probably leave the United States via a program such as P.L. 480. The 1985 oil export level will be about 700 million pounds above the 1975 level, but still would be less than the record 1.8 billion pounds of 1970.



Soybean oil: Supply and disposition, crop years, 1960, 1965, 1970, 1973-75 and projection for 1985

Year beginning October	1960	1965	1970	1973	1974	1975[1]	1985[2]
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
Supply:							
Beginning stocks	308	297	543	516	794	561	840
Production	4,420	5,800	8,265	8,995	7,375	8,639	10,100
Total supply	4,728	6,097	8,808	9,511	8,169	9,200	10,940
Disposition:							
Domestic use	3,329	4,687	6,253	7,256	6,518	7,150	8,500
Exports and shipments	721	948	1,782	1,461	1,090	900	1,600
Total disposition	4,050	5,635	8,035	8,717	7,608	8,050	10,100

[1] Preliminary. [2] Projected.

U.S. EDIBLE FATS AND OILS REFINING CAPACITIES, 1975

by

George W. Kromer
and
Stanley A. Gazelle

ABSTRACT: A special USDA survey of U.S. edible fats and oils refiners shows that the industry's maximum annual refining capacity at the end of 1975 totaled 17.0 billion pounds (7.7 million metric tons). Another 1.3 billion pounds of capacity was under construction and was scheduled for completion during 1976 and 1977, boosting potential refining capacity to 18.3 billion pounds (8.3 million metric tons). The industry's capacity has expanded about a third since 1967, the last special USDA survey. For the year ending September 1974, the industry operated at about 60 percent of capacity for refining and production of refinery products such as shortening, salad and cooking oils, and margarine oil. The industry's packing rate was about half of its estimated maximum capacity. In 1975 there were 49 companies operating 97 edible fats and oil refineries in the United States. All participated in the USDA survey.

KEYWORDS: Edible fats and oils refineries, refining capacity, fats and oils production and packing capacities.

Highlights of 1975 Survey

In mid-1975 the USDA conducted a mail survey requesting information on capacities and output from all known U.S. refiners of edible fats and oils. Data received, representing 100 percent of the industry's capacity, revealed these major highlights:

(1) Maximum annual refining capacity continues to expand. As of December 31, 1975, it totaled 17.0 billion pounds.[1] This represents an increase of about a third from the 12.7 billion-pound-capacity reported in the 1967 USDA special survey (FOS-244, September 1968). Another 1.3 billion pounds of capacity was under construction and was scheduled for completion during 1976 and 1977, boosting potential refining capacity to 18.3 billion pounds (table 14).

(2) The industry's optimum practical capacity for refining and further processing (bleaching, hydrogenation, winterizing, deodorizing) averages about 85 percent of maximum capacity.

(3) The total number of companies (49) and refineries (97) operating in 1975 was greater than in 1967, and the average size of plants has increased more than a tenth. In the case of alkali refining capacity, the 14 largest plants (350-750 million pounds maximum capacity) accounted for nearly one-half of total U.S. refining and further processing capacities for edible fats and oils.

(4) The industry operated at about 60 percent of its estimated maximum annual capacity for refining (over 70 percent of optimum practical) as well as for production of refinery products during the year ending September 1974. The utilization rates for bleaching, hydrogenation, and deodorization averaged about two-thirds of maximum capacity, whereas winterization averaged three-fourths. The refineries' packing rate was about half of their estimated maximum capacity.

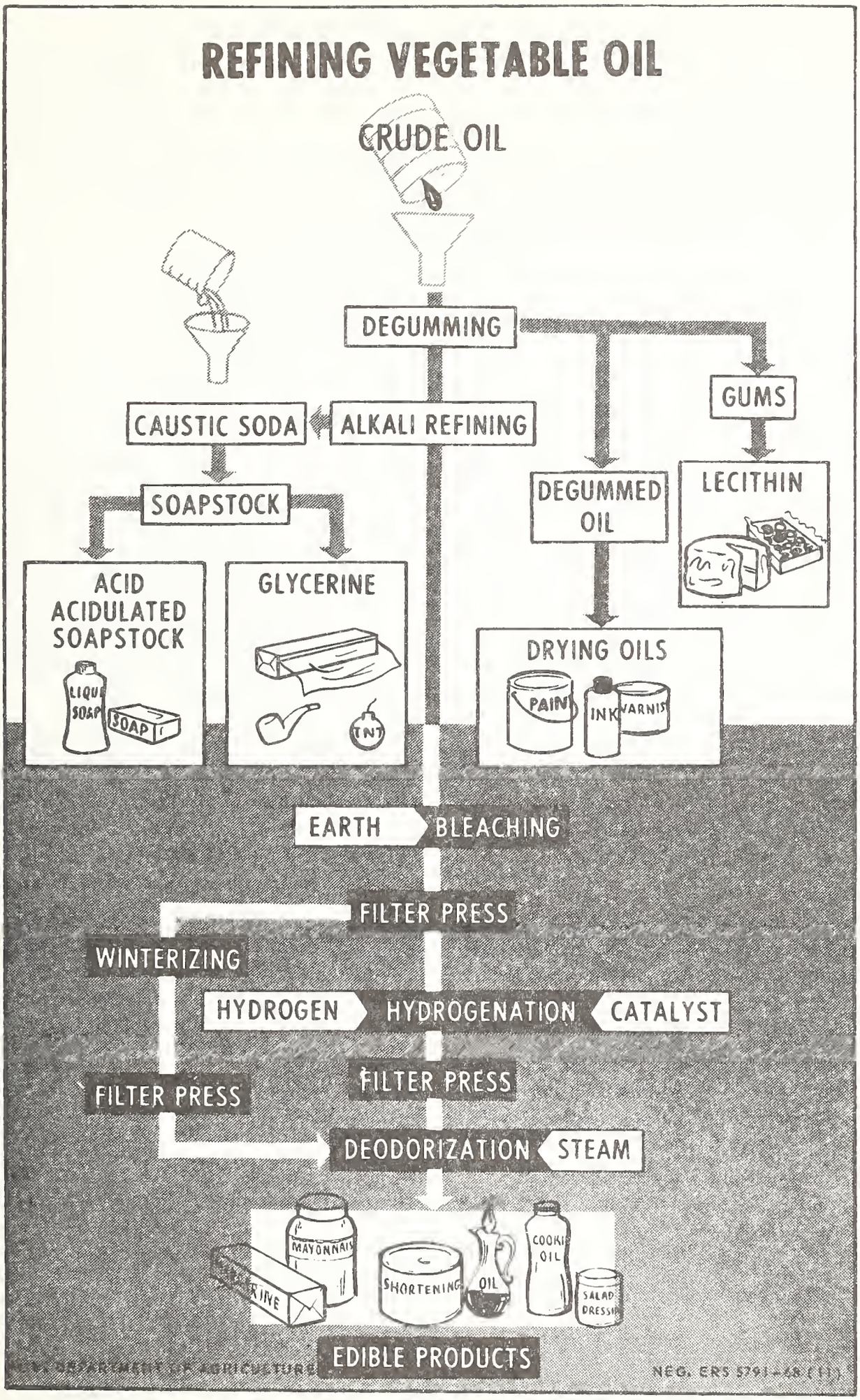
(5) Most refiners produced finished products. The total pack of edible fats and oils during 1973/74 was 11.5 billion pounds, about 9.3 billion pounds or 80 percent of which were liquids. Three-fourths of the liquid pack was shipped in bulk. For the solid pack, about half was in consumer-sized 1- to 3-pound containers, and over 40 percent was in 50- to 60-pound tins or cubes.

[1]Maximum annual capacity estimates throughout this report are as of December 31, 1975, and are based on the October 1973-September 1974 product mix and the assumption that the plant operates a 52-week year, a 7-day week, and a 24-hour day. Optimum practical capacity is based on normal or average shutdown time for repairs, replacements, cleaning, etc.

TABLE 14.--U.S. EDIBLE FATS AND OILS REFINING CAPACITIES, 1975, AND UNDER CONSTRUCTION FOR COMPLETION IN 1976 AND 1977 1/

ITEM	PRODUCTION CAPACITY			PRODUCTION (OCT. 1973 - SEPT. 1974)	
	1975 (END OF YEAR) 2/		UNDER CONSTRUCTION 3/	TOTAL	PROPORTION OF MAXIMUM CAPACITY
	MAXIMUM	OPTIMUM PRACTICAL			
	MILLION POUNDS				PERCENT
REFINING:					
ALKALI	16,325	13,831	4/	9,894	61
STEAM	381	339	4/	204	54
MISCELLA	330	314	---	182	55
TOTAL	17,036	14,484	1,310	10,280	60
FURTHER PROCESSING:					
BLEACHING	15,575	13,240	1,227	9,619	62
REARRANGEMENT	606	485	---	183	30
HYDROGENATION	8,651	7,384	636	5,638	65
WINTERIZING	2,313	1,950	377	1,769	76
DEODORIZING	14,553	12,632	1,477	9,322	64
PLASTICIZING	5,947	3,790	4/	2,087	35
OTHER	376	110	---	68	18
REFINERY PRODUCTS:					
SALAD AND COOKING OILS	6,328	5,455	358	4,093	65
BAKING & FRYING FATS	5,841	4,953	612	3,618	62
MARGARINE OIL	3,228	2,689	4/	1,864	58
SOAP STOCKS/FOOTS	660	557	21	458	69
NONFOOD INDUSTRIAL	111	86	4/	22	20
OTHER	741	713	4/	438	59
TOTAL	16,909	14,453	1,358	10,493	62
PACKING:					
LIQUID SHORTENING--					
DRUM	---	374		52	
5-GAL. CONTAINER	---	764		419	
10-QT. CONTAINER	---	67		44	
1-GAL. CONTAINER	---	796		323	
5-QT. CONTAINER	---	164		130	
OTHER	---	495		274	
OTHER LIQUID OIL	---	990		760	
TOTAL LIQUIDS	---	3,650	5/	2,002	6/55
SOLIDS AT ROOM TEMPERATURE--					
350-450 LB. DRUM	---	566		59	
110-120 LB. CONTAINER	---	625		79	
50-60 LB. TINS OR CUBES	---	2,122		955	
1-3 LB. CONTAINER	---	1,832		1,041	
OTHER	---	206		96	
TOTAL SOLIDS	---	5,351	5/	2,230	6/42
BULK SHIPMENTS	---	7/7,291		7,291	
TOTAL LIQUIDS AND SOLIDS	8/	16,292		11,523	6/71

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975. 2/ INCLUDES ALL REPORTED EXPANSIONS THROUGH DECEMBER 1975. 3/ FOR COMPELTION IN 1976 AND 1977. 4/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANY'S OPERATIONS. 5/ NONE REPORTED. 6/ PROPORTION OF OPTIMUM PRACTICAL CAPACITY. 7/ REFINERS WERE NOT ASKED TO REPORT BULK CAPACITY. THIS FIGURES IS BASED ON 1973/74 BULK SHIPMENTS, AS THEY HAD AT LEAST THIS MUCH CAPACITY. 8/ NOT INCLUDED IN SURVEY.


REFINING VEGETABLE OIL
CRUDE OIL
DEGUMMING
GUMS
CAUSTIC SODA
ALKALI REFINING
SOAPSTOCK
DEGUMMED OIL
LECITHIN
ACID ACIDULATED SOAPSTOCK
GLYCERINE
DRYING OILS
PAINT
INK
VARNISH
LIQUID SOAP
SOAP
TNT
EARTH
BLEACHING
FILTER PRESS
WINTERIZING
HYDROGEN
HYDROGENATION
CATALYST
FILTER PRESS
FILTER PRESS
DEODORIZATION
STEAM
MAYONNAISE
SHORTENING
OIL
COOKING OIL
SALAD DRESSING
EDIBLE PRODUCTS
U.S. DEPARTMENT OF AGRICULTURE
NEG. ERS 5791-68 (11)

(6) Maximum bulk edible fats and oils loading capacity per day at refining plants totals an estimated 100 million pounds, 70 percent of which is for fully refined and deodorized commodities. The capacity for bulk storage of edible fats and oils at the plant exceeds 2 billion pounds.

The Survey

During the summer of 1975 the USDA conducted a mail survey of all known U.S. refiners of edible fats and oils. At the time of the survey, there were 49 companies with 97 refineries in operation. Pertinent data were obtained on refining facilities, intermediate processing, refinery products, and packing output and capacities as well as on new capacity under construction. The last USDA survey on industry capacity was made in 1967.

Most plants in the survey alkali refine edible vegetable oils, and most manufacture products such as baking and frying fats (shortening), salad and cooking oils, and margarine. The survey also included steam refiners of lard and edible tallow and miscella refiners of cottonseed oil. Palm oil steam-refining data are included with alkali refining.

The survey information summarized here accounts for 100 percent of both the U.S. refining and packaging capacity and of the actual volume of production and packaging of edible fats and oils. Survey data on total production of finished products are within 1 percent of published Census statistics. The data are summarized and shown in such a way that the operations of individual companies are not disclosed.

The Institute of Shortening and Edible Oils, Inc., cooperated with USDA in the conduct of the survey.

Refining Process

The U.S. refining industry encompasses those plants which conduct one or more of the continuous processing operations used to refine crude fats and oils for food use. Refining removes any undesirable elements such as non-fatty materials termed "gums," (primarily phosphatides), color bodies or pigments, and free fatty acids. The clear yellow oil remaining may be further processed by bleaching, hydrogenation, winterization, or deodorization, depending upon the type of fat or oil processed and its ultimate use.

Refining purifies crude oil by combining it with an alkali (usually caustic soda) or by some other chemical or steam operation. The removed impurities are known as soapstock, an important ingredient used to make soap and glycerine. Miscella refining is the process applied to crude cottonseed oil.

A Fifth of Refineries Account For Nearly Half of U.S. Capacity

In the United States, the alkali refining process for edible fats and oils is the most common. Sixty-seven refineries reported maximum alkali refining capacity of 16.3 billion pounds as of the end of 1975, about 96 percent of total capacity. Steam refineries (17 plants) accounted for 0.4 billion pounds and miscella refineries (6) accounted for 0.3 billion pounds.

Refineries employing the alkali refining process were arrayed by plant size in terms of maximum annual capacity. The 14 largest refineries (350-750 million pounds) accounted for 41 percent of total alkali refining capacity, or 6.6 of 16.3 billion pounds. They also accounted for nearly half of the capacities for further processed edible oils and for 37 percent of the refinery products. A profile of these refineries is presented in table 15.

The second largest group of refineries (19 plants having maximum capacities of 250-325 million pounds) has an alkali refining capacity of 5.3 billion pounds or 32 percent of the U.S. total. This group accounted for over 30 percent of capacity for further processing and 35 percent for manufacturing refinery products.

The third group (17 plants having capacities of 125-250 million pounds) with maximum alkali refining capacity of 3.2 billion pounds accounted for a fifth of all capacities.

The smaller edible oil refineries (17 plants having 25-125 million pounds capacity) accounted for 8 percent or less of the industry capacities for alkali refining, further processing, and refinery product manufacturing.

Capacity Expansion Underway

Twenty refineries reported planned expansion in capacities for refining, intermediate processing, and manufacturing food fat products. This new capacity under construction is at existing plants and is scheduled to be in operation before the end of 1977. No completely new alkali refining plants were reported under construction.

Five plants are increasing refining capacity (alkali and steam) a total of 8 percent or 1.3 billion pounds, pushing total U.S. capacity for edible fats and oils to 18.3 billion pounds when completed.

Expansion is also underway in the major intermediate processing stages for edible fats and oils. Bleaching capacity at five plants is expected to expand 8 percent or 1.2 billion pounds, with the U.S. total reaching 16.8 billion by end of 1977. Hydrogenation expansions at six plants of 0.6 billion pounds will boost total U.S. capacity to 9.3 billion. Five refineries are expanding winterizing facilities by 0.4 billion pounds, boosting the

TABLE 15.--PROFILE OF U.S. EDIBLE FATS AND OILS REFINING INDUSTRY: PLANTS GROUPED BY MAXIMUM ALKALI REFINING CAPACITY, 1975 1/

PLANT SIZE 2/	REFINERIES REPORTING	TOTAL ALKALI REFINING CAPACITY	FURTHER PROCESSING				REFINERY PRODUCTS					
			BLEACHING	HYDROGENATION	WINTERIZING	DEODORIZING	PLASTICIZING	SALAD AND COOKING OILS	BAKING AND FRYING FATS	MARGARINE OIL	SOAP STOCK FOOTS	OTHER	TOTAL
MIL. LB.	NO.	-MIL. LB.-											
350-750	14	6,644	6,186	3,857	991	5,716	2,310	1,879	2,077	1,411	197	287	5,851
250-325	19	5,276	4,609	2,511	853	4,529	1,547	2,791	1,362	982	200	274	5,609
125-250	17	3,150	3,067	1,808	298	2,933	1,360	806	1,523	707	218	76	3,330
25-125	17	1,255	854	274	---	568	3/	534	280	3/	31	3/	1,035
U.S. TOTAL	67	16,325	14,716	8,450	2,142	13,746	3/	6,010	5,242	3/	646	3/	15,825
	PERCENTAGE DISTRIBUTION												
	-PERCENT-												
350-750	21	41	42	46	46	42	3/	31	40	3/	30	3/	37
250-325	29	32	31	30	40	33	3/	46	26	3/	31	3/	35
125-250	25	19	21	21	14	21	3/	14	29	3/	34	3/	21
25-125	25	8	6	3	---	4	3/	9	5	3/	5	3/	7
U.S. TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975.

2/ BASED ON ANNUAL MAXIMUM ALKALI REFINING CAPACITY FOR EACH REFINERY.

3/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANIES' OPERATIONS.

U.S. EDIBLE FATS AND OILS REFINING PLANTS AND MAXIMUM CAPACITY BY REGIONS 1975

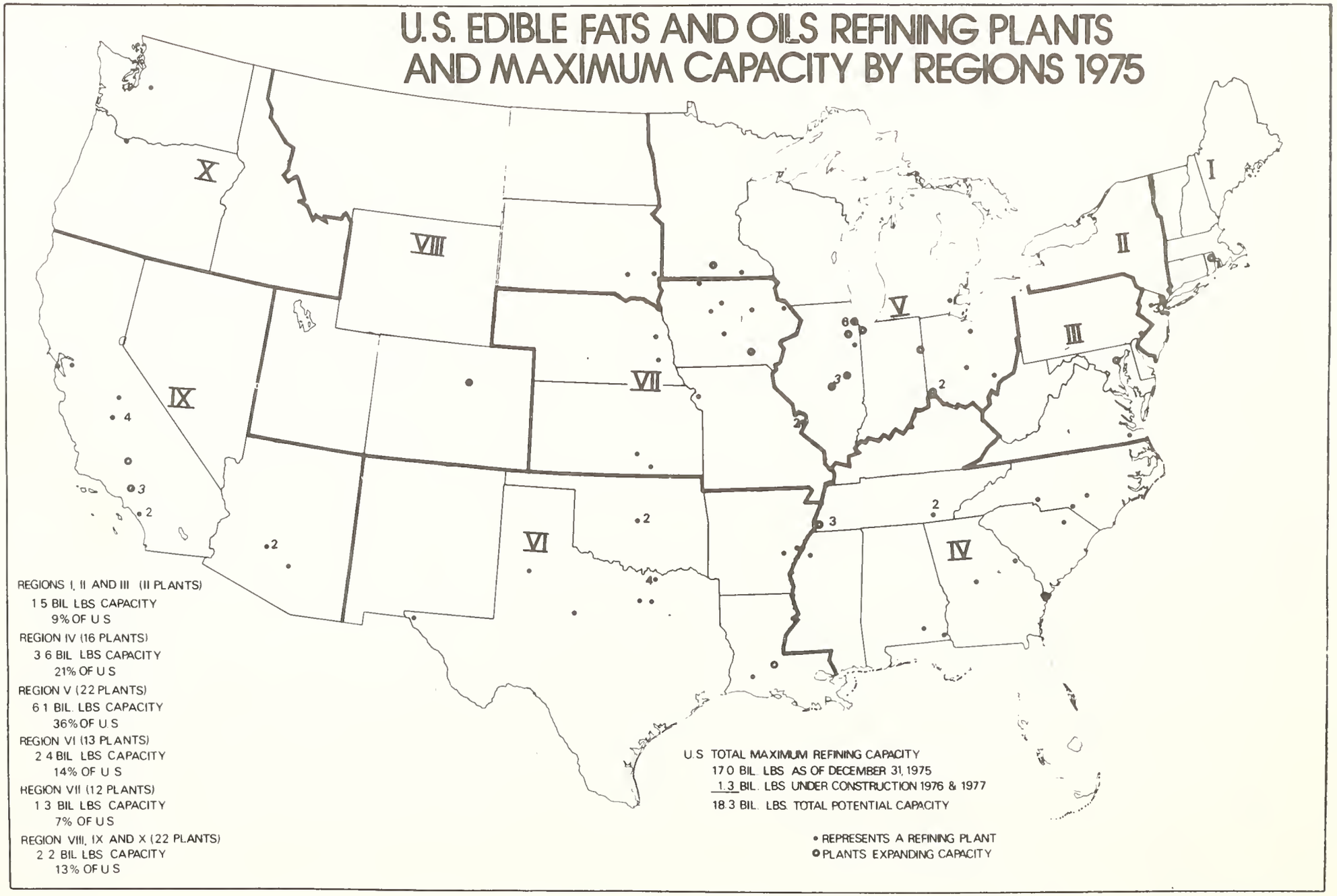


Table 16.--U.S. MAXIMUM ANNUAL PRODUCTION CAPACITY FOR REFINED EDIBLE FATS AND OILS, BY REGIONS, AS OF DECEMBER 31, 1975 1/

REGION	REFIN-ERIES REPORTING	REFINING: ALKALI	STEAM	MISCELLA	TOTAL	FURTHER PROCESSING: BLEACHING	REARRANGEMENT	HYDROGENATION	FRACTIONATION: GENERAL WINTERIZING	FRACTIONATION: OTHER	DEODORIZING	PLASTICIZING	OTHER	REFINERY PRODUCTS: SALAD AND COOKING OILS	BAKING AND FRYING FATS	MARGARINE AND OIL	SOAP STOCK: FOOTS	NON-FOOD INDUSTRIAL	OTHER	TOTAL
	NUMBERS	MILLION POUNDS																		
REGIONS 1, 2, 3: NJ,NY,RI,PA,MD, VA	11	2/	2/	---	1,522	1,573	147	769	2/	---	1,676	1,011	2/	710	738	2/	60	2/	2/	1,916
REGION 4: AL,GA,KY,MS,NC, SC,TN	16	2/	---	2/	3,628	3,439	2/	1,927	434	2/	3,129	1,049	---	1,521	958	542	204	2/	2/	3,259
REGION 5: IL,IN,MI,MN,OH	22	2/	2/	---	6,126	5,702	250	3,433	862	2/	5,650	2,113	2/	1,917	2,370	1,394	169	2/	2/	6,195
REGION 6: AR,LA,OK,TX	13	2/	2/	2/	2,352	2,050	2/	1,062	297	---	1,838	1,102	2/	1,096	766	188	76	---	308	2,434
REGION 7: IA,KS,MO,NE	12	1,050	211	---	1,261	1,285	2/	467	2/	---	712	---	---	507	317	2/	70	2/	50	1,177
REGIONS 8, 9, 10: AZ,CA,CO,ND,OR, SD,WA	22	1,917	2/	2/	2,147	1,526	111	993	364	---	1,548	672	2/	577	692	570	81	---	8	1,929
U.S. TOTAL	96	16,325	381	330	17,036	15,575	606	8,651	2,313	2/	14,553	5,947	376	6,328	5,841	3,228	660	111	741	16,909
	PERCENTAGE DISTRIBUTION																			
	PERCENT																			
REGIONS 1, 2, 3	10	2/	2/	---	9	10	24	9	2/	---	12	17	2/	12	13	2/	9	2/	2/	11
REGION 4	17	2/	---	2/	21	22	2/	22	19	2/	21	18	---	24	16	15	31	2/	2/	19
REGION 5	23	2/	2/	---	36	37	41	40	38	2/	39	35	2/	30	40	39	26	2/	2/	37
REGION 6	14	2/	2/	2/	14	13	2/	12	13	---	13	19	2/	17	13	16	11	---	42	14
REGION 7	13	6	55	---	7	8	2/	5	2/	---	5	---	---	8	6	2/	11	2/	7	7
REGIONS 8, 9, 10	23	12	2/	2/	13	10	18	11	16	---	10	11	2/	9	12	16	12	---	1	12
U.S. TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975. MAXIMUM CAPACITY INCLUDES ALL REPORTED EXPANSIONS THROUGH DECEMBER 1975.
2/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANIES' OPERATIONS.

TABLE 17.--U.S. PRODUCTION OF REFINED EDIBLE FATS AND OILS, BY REGIONS, OCTOBER 1973-SEPTEMBER 1974 1/

REGION	REFIN-ERIES REPORTING	REFINING: ALKALI	STEAM	MISCELLA	TOTAL	FURTHER PROCESSING: BLEACHING	REARRANGEMENT	HYDROGENATION	FRACTIONATION: GENERAL WINTERIZING	FRACTIONATION: OTHER	DEODORIZING	PLASTICIZING	OTHER	REFINERY PRODUCTS: SALAD AND COOKING OILS	BAKING AND FRYING FATS	MARGARINE AND OIL	SOAP STOCK: FOOTS	NON-FOOD INDUSTRIAL	OTHER	TOTAL
	NUMBERS	MILLION POUNDS																		
REGIONS I, 2, 3: NJ,NY,RI,PA,MD, VA	11	2/	2/	---	921	778	-61	2/	2/	---	2/	361	2/	444	2/	2/	27	2/	2/	998
REGION 4: AL,GA,KY,MS,NC, SC,TN	16	2/	---	2/	2,176	2,147	2/	1,268	349	---	1,984	273	---	907	771	405	166	2/	2/	2,258
REGION 5: IL,IN,MI,MN,OH	22	2/	2/	---	3,833	3,922	53	2,393	699	2/	3,750	912	2/	1,467	1,500	807	119	2/	2/	4,088
REGION 6: AR,LA,OK,TX	13	2/	2/	2/	1,435	1,124	2/	709	216	---	1,250	369	2/	505	538	220	59	---	161	1,483
REGION 7: IA,KS,MO,NE	12	571	120	---	691	601	---	2/	2/	---	2/	---	---	337	2/	2/	41	2/	50	647
REGIONS 8, 9, 10: AZ,CA,CO,ND,OR, SD,WA	22	1,102	2/	2/	1,224	1,047	11	621	315	---	1,036	172	---	434	313	219	47	---	7	1,019
U.S. TOTAL	96	9,894	204	182	10,280	9,619	183	5,638	1,769	2/	9,322	2,087	68	4,093	3,618	1,864	458	22	438	10,493
	PERCENTAGE DISTRIBUTION																			
	PERCENT																			
REGIONS 1, 2, 3	10	2/	2/	---	9	8	33	2/	2/	---	2/	17	2/	11	2/	2/	6	2/	2/	10
REGION 4	17	2/	---	2/	21	22	2/	22	20	---	21	13	---	22	21	22	36	2/	2/	21
REGION 5	23	2/	2/	---	37	41	29	42	40	2/	40	44	2/	36	41	43	26	2/	2/	39
REGION 6	14	2/	2/	2/	14	12	2/	13	12	---	13	18	2/	12	15	12	13	---	37	14
REGION 7	13	6	59	---	7	6	---	2/	2/	---	2/	---	---	8	2/	2/	9	2/	11	6
REGIONS 8, 9, 10	23	11	13	2/	12	11	6	11	18	---	11	9	---	11	8	12	10	---	1	10
U.S. TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975. 2/ WITHHELD TO AVOID DISCLUSURE OF INDIVIDUAL COMPANIES' OPERATIONS.

Nation's potential capacity to 2.7 billion pounds. The sharpest expansion will occur in deodorizing capacity, as seven refineries show a 1.5 billion pound or 10 percent prospective increase. This will boost total U.S. deodorization capacity to 16.0 billion pounds (table 14).

New production capacity under construction for refinery products totals 1.4 billion pounds, with eight plants involved. This represents an increase of 8 percent over the 16.9 billion pounds as of December 31, 1975. Most of this new capacity will be used to produce baking and frying fats, salad and cooking oils, and margarine oil.

Refineries Concentrated in Oil Producing Areas and Metro Centers

The survey data have been summarized both nationally and regionally insofar as possible. The United States was divided into the ten standard federal administrative regions used by the government. In some cases it was necessary to combine regions in order to avoid disclosure of individual company operations.

The 97 edible fats and oils refineries are in 31 States. They tend to be clustered in soybean and cottonseed production areas and in large metropolitan consuming centers. Soybean and cottonseed oils account for a large proportion of all the edible vegetable oils once-refined.

About three-fifths of the refineries are concentrated in seven States as follows: California, 13 plants; Illinois, 12 plants; Texas, 9 plants; Iowa, 7 plants; New Jersey, 7 plants; Ohio, 5 plants; and Tennessee, 5 plants.

Major Production in Mid-America

U.S. production of refined edible fats and oils (alkali, steam, and miscella) totaled 10.3 billion pounds during the 1973/74 marketing year. Maximum annual production capacity as of December 31, 1975, was 17.0 billion pounds, indicating the refining industry operated at about 60 percent of its potential capacity. This represents about a 34-percent increase over the 12.7 billion pounds refining capacity reported in the 1967 special USDA survey. These data are summarized in tables 16 and 17 by regions.

Region 5 ranked first in maximum annual refinery capacity, reporting 6.1 billion pounds or 36 percent of the total—Illinois is the leading soybean State, partly explaining the heavy concentration of refining facilities in this region. The refining industry is largely dependent upon the crude oil output of oilseed crushers, since vegetable oils constitute the major portion of domestically-produced edible fats and oils. Region 4 ranked second, followed by Region 6.

Before refined vegetable oils are used in finished products, they generally undergo secondary processing. The survey shows that edible oils go through an average of three stages of further processing (intermediate processes beyond alkali refining), and that most refineries have some packing facilities for finished products other than bulk. About two-thirds of the refineries performed a complete refining process. The extent of further refining of edible oils largely depends upon markets supplied and the end-products manufactured.

Refiners Packing Facilities

Among the 97 plants responding, 55 had some facilities for packing products (other than bulk) at the refinery location. The others shipped in bulk the processed oil or fat to other plants for product manufacture and packaging. The total pack of edible fats and oils in all kinds of containers (including bulk) was 11.5 billion pounds during 1973/74, whereas packing capacity exceeded 16 billion pounds.

The liquid shortening pack was 2.0 billion pounds—mostly in 1- and 5-gallon containers—which represented about 55 percent of available capacity.

The pack of solids at room temperature was 2.2 billion pounds whereas the optimum practical capacity was 5.4 billion pounds as of December 31, 1975. The solid pack in 1- to 3-pound consumer-sized containers was 1.0 billion pounds and in 50- to 60-pound tins or cubes was also 1.0 billion.

Approximately 7.3 billion pounds of food fats and oils were shipped in bulk during 1973/74, three-fourths of which were fully refined and deodorized oils. Refiners were not specifically asked to provide capacity estimates for bulk shipment of products. For analytical purposes, however, the bulk capacity was assumed to at least equal the actual shipments during 1973/74.

Regional data on packing capacity and the 1973/74 pack in various sized containers are shown in tables 18 and 19.

Refiners' Loading and Storage Capacities

The maximum bulk loading capacity per day for edible fats and oils at refining plants totals an estimated 100 million pounds, 70 percent of which is for fully refined and deodorized commodities. In other words, the U.S. refining industry had load out capacity to move the entire 1973/74 output of 10.3 billion pounds in about 100 days. A large percentage of this capacity is in the Midwestern States.

U.S. capacity for bulk storage of edible fats and oils at refinery sites was reported at 2.1 billion pounds (table 20). At the 1973/74 production rates, this would be equivalent to about 2 months' supply. This total is understated because some refiners

TABLE 18.--U.S. OPTIMUM PRACTICAL ANNUAL PACKINC CAPACITY AT REFINERIES FOR EDIBLE FATS AND OILS, BY RECIONS, AS OF DECEMBER 31, 1975 1/

RECION	REFIN-ERIES RE-PORT-ING	LIQUID SHORTENINC PACKED IN							SOLIDS AT ROOM TEMPERATURE PACKED IN								TOTAL LIQUIDS AND SOLIDS
		DRUMS	5 GAL. CON-TAINERS	10 QT. CON-TAINERS	1 CAL. CON-TAINERS	5 QT. CON-TAINERS	OTHER	TOTAL LIQUID	OTHER OIL	TOTAL LIQUIDS	350-450 LB DRUMS	110-120 LB CON-TAINERS	50-60 LB. CON-TAINERS	1-3 LB. CON-TAINERS	OTHER	TOTAL	BULK SHIP-MENTS
	NUMBER	MILLION POUNDS															
REGIONS 1, 2, 3: NJ,NY,RI,PA,MD,VA	11	127	163	2/	169	2/	2/	570	201	771	165	2/	404	232	2/	974	451	2,196
REGION 4: AL,CA,KY,MS,NC,SC,TN	16	87	432	2/	355	2/	64	1,025	2/	2/	15	2/	298	143	2/	2/	1,648	3,376
RECION 5: IL,IN,MI,MN,OH	22	84	104	2/	187	2/	264	729	237	966	273	2/	932	633	2/	2,128	2,650	5,744
RECION 6: AR,LA,OK,TX	13	49	40	2/	66	2/	2/	200	2/	2/	2/	116	2/	518	2/	916	988	2,293
RECION 7: IA,KS,MO,NE	12	2/	2/	---	2/	2/	---	2/	---	2/	2/	2/	2/	---	---	2/	654	694
RECIONS 8, 9, 10: AZ,CA,CO,ND,OR,SD,WA	21	2/	2/	2/	2/	---	2/	2/	2/	274	102	113	250	306	45	815	900	1,989
U.S. TOTAL	95	374	764	67	796	164	495	2,659	990	3,650	566	625	2,122	1,832	206	5,351	7,291	16,292
	PERCENTAGE DISTRIBUTION																	
	PERCENT																	
REGIONS 1, 2, 3	11	34	21	2/	21	2/	2/	21	20	21	29	2/	19	12	2/	18	6	14
RECION 4	17	23	56	2/	45	2/	13	39	2/	2/	3	2/	14	8	2/	2/	23	21
RECION 5	23	23	14	2/	24	2/	53	27	24	26	48	2/	44	35	2/	40	36	35
REGION 6	14	13	5	2/	8	2/	2/	8	2/	2/	2/	19	2/	28	2/	17	14	14
RECION 7	13	2/	2/	---	2/	2/	---	2/	---	2/	2/	2/	2/	---	---	2/	9	4
REGIONS 8, 9, 10 U.S. TOTAL	22	2/	2/	2/	2/	---	2/	2/	2/	7	18	18	12	17	22	15	12	12
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975. MAXIMUM CAPACITY INCLUDES ALL REPORTED EXPANSIONS THROUCH DECEMBER 1975.
2/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANIES' OPERATIONS.

TABLE 19.--EDIBLE FATS AND OILS PACKED AT REFINERIES IN THE UNITED STATES, BY RECIONS, OCTOBER 1973-SEPTEMBER 1974 1/

RECION	REFIN-ERIES RE-PORT-ING	LIQUID SHORTENING PACKED IN							SOLIDS AT ROOM TEMPERATURE PACKED IN								TOTAL LIQUIDS AND SOLIDS
		DRUMS	5 GAL. CON-TAINERS	10 QT. CON-TAINERS	1 CAL. CON-TAINERS	5 QT. CON-TAINERS	OTHER	TOTAL LIQUID	OTHER OIL	TOTAL LIQUIDS	350-450 LB DRUMS	110-120 LB CON-TAINERS	50-60 LB. CON-TAINERS	1-3 LB. CON-TAINERS	OTHER	TOTAL	BULK SHIP-MENTS
	NUMBER	MILLION POUNDS															
REGIONS 1, 2, 3: NJ,NY,RI,PA,MD,VA	11	6	24	2/	12	2/	22	92	153	245	6	2/	86	124	2/	219	451	915
REGION 4: AL,CA,KY,MS,NC,SC,TN	16	22	353	2/	249	2/	11	720	171	891	13	6	211	96	5	331	1,648	2,870
RECION 5: IL,IN,MI,MN,OH	22	18	26	2/	54	2/	164	320	208	528	22	2/	420	427	2/	900	2,650	4,079
RECION 6: AR,LA,OK,TX	13	2/	8	2/	4	2/	2/	67	120	187	2/	60	117	256	2/	491	988	1,666
RECION 7: IA,KS,MO,NE	12	2/	---	---	---	---	---	2/	---	2/	2/	2/	2/	---	---	2/	654	683
RECIONS 8, 9, 10: AZ,CA,CO,ND,OR,SD,WA	21	3	8	2/	4	---	2/	2/	108	2/	8	5	2/	138	2/	2/	900	1,310
U.S. TOTAL	95	52	419	44	323	130	274	1,242	760	2,002	59	79	955	1,041	96	2,230	7,291	11,523
	PERCENTAGE DISTRIBUTION																	
	PERCENT																	
RECIONS 1, 2, 3	11	12	6	2/	4	2/	8	7	21	12	9	2/	9	12	2/	10	6	8
RECION 4	17	42	84	2/	77	2/	4	58	22	45	22	8	22	9	5	15	23	25
RECION 5	23	35	6	2/	17	2/	60	26	27	26	36	2/	44	41	2/	40	36	35
REGION 6	14	2/	2	2/	1	2/	2/	5	16	9	2/	76	12	25	2/	22	14	15
REGION 7	13	2/	---	---	---	---	---	2/	---	2/	2/	2/	2/	---	---	2/	9	6
RECIONS 8, 9, 10 U.S. TOTAL	22	5	2	2/	1	---	2/	2/	14	2/	14	7	2/	13	2/	2/	12	11
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975. 2/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANIES' OPERATIONS.

TABLE 20.--U.S. REFINERY BULK SHIPMENTS OF EDIBLE FATS AND OILS, BY REGIONS, 1973/74, AND MAXIMUM BULK STORAGE CAPACITY AT PLANT 1/

REGION	REFINERIES REPORTING	QUANTITY SHIPPED DURING OCTOBER 1973-SEPTEMBER 1974				MAXIMUM BULK STORAGE CAPACITY AT PLANT, 1975
		ONCE REFINED (ALKALI OR STEAM)	FULLY REFINED AND DEODORIZED	OTHER	TOTAL	
	NUMBER	MILLION POUNDS				
REGIONS 1, 2, 3: NJ,NY,RI,PA, MD,VA	11	2/	407	2/	451	287
REGION 4: AL,GA,KY,MS, NC,SC,TN	16	203	1,338	107	1,648	441
REGION 5: IL,IN,MI,MN,OH	22	221	2,063	366	2,650	617
REGION 6: AR,LA,OK,TX	13	414	499	75	988	366
REGION 7: IA,KS,MO,NE	12	2/	464	2/	654	68
REGIONS 8, 9, 10: AZ,CA,CO,ND, OR, SD,WA	21	271	572	57	900	298
U.S. TOTAL	95	1,275	5,343	673	7,291	3/2,077
	PERCENTAGE DISTRIBUTION					
	-PERCENT-					
REGIONS 1, 2, 3	11	2/	8	2/	6	14
REGION 4	17	16	25	16	23	21
REGION 5	23	17	39	54	36	30
REGION 6	14	32	9	11	14	18
REGION 7	13	2/	9	2/	9	3
REGIONS 8, 9, 10	22	21	10	9	12	14
U.S. TOTAL	100	100	100	100	100	100

1/ DATA COMPILED FROM SPECIAL USDA SURVEY CONDUCTED IN MID-1975.
2/ WITHHELD TO AVOID DISCLOSURE OF INDIVIDUAL COMPANIES' OPERATIONS.
3/ THIS FIGURE IS UNDERSTATED BECAUSE SOME REFINERS (12) DID NOT REPORT THEIR STORAGE CAPACITY FOR BULK FATS AND OILS.

TABLE 21.--U.S. EDIBLE FATS AND OILS REFINING CAPACITIES AND PRODUCTION, 1975 AND 1967 1/

ITEM	MAXIMUM ANNUAL PRODUCTION CAPACITY, TOTAL			PRODUCTION, OCTOBER-SEPTEMBER			PROPORTION OF MAXIMUM CAPACITY UTILIZATION	
	1975	1967	1975 AS PERCENT OF 1967	1973/74	1966/67	1973/74 AS PERCENT OF 1966/67	1973/74	1966/67
	--MILLION POUNDS--		PERCENT	--MILLION POUNDS--			-PERCENT-	
REFINING:								
ALKALI	16,325	12,346	132	9,894	7,857	126	61	64
STEAM	381	360	106	204	273	75	54	76
MISCELLA	330	N.A.	N.A.	182	N.A.	N.A.	55	N.A.
TOTAL	17,036	12,706	134	10,280	8,130	126	60	64
FURTHER PROCESSING:								
BLEACHING	15,575	13,037	119	9,619	8,590	112	62	66
REARRANGEMENT	606	441	137	183	162	113	30	37
HYDROGENATION	8,651	6,223	139	5,638	4,432	127	65	71
WINTERIZING	2,313	1,602	144	1,769	1,119	158	76	70
DEODORIZING	14,553	10,929	133	9,322	8,345	112	64	76
PLASTICIZING	5,947	4,899	121	2,087	2,005	104	35	41
OTHER	376	288	131	68	136	50	18	47
REFINERY PRODUCTS:								
SALAD AND COOKING OILS	6,328	3,608	175	4,093	2,911	141	65	81
BAKING AND FRYING FATS	5,841	5,362	109	3,618	3,132	116	62	58
MARGARINE OIL	3,228	2/2,984	108	1,864	2/1,949	96	58	65
SOAP STOCK/FOOTS	660	N.A.	N.A.	458	N.A.	N.A.	69	N.A.
NONFOOD INDUSTRIAL	111	N.A.	N.A.	22	N.A.	N.A.	20	N.A.
OTHER	741	733	101	438	581	75	59	79
TOTAL	16,909	12,686	133	10,493	8,572	122	62	68
PACKING:								
LIQUIDS--								
DRUMS				52	114	46		
5-GALLON CONTAINERS				419	96	437		
10-QUART CONTAINERS				44	N.A.	N.A.		
1-GALLON CONTAINERS				323	307	105		
5-QUART CONTAINERS				130	N.A.	N.A.		
OTHER				274	425	64		
OTHER LIQUID OIL				760	N.A.	N.A.		
TOTAL LIQUIDS				2,002	942	212		
SOLIDS--								
340-450-POUND DRUMS				59	240	25		
110-120-POUND CONTAINERS				79	122	65		
50-60-POUND TINS OR CUBES				955	942	101		
8-49-POUND CONTAINERS				N.A.	64	N.A.		
ALL UNDER 8 POUNDS				N.A.	1,158	N.A.		
1-3 LB. CONTAINERS				1,041	N.A.	N.A.		
OTHER				96	N.A.	N.A.		
TOTAL SOLIDS				2,230	2,526	88		
BULK SHIPMENTS				7,291	5,142	142		
TOTAL LIQUIDS AND SOLIDS	3/			11,523	8,611	134		

1/ DATA COMPILED FROM SPECIAL USDA SURVEYS OF EDIBLE FATS AND OILS REFINERS. NINETY-SEVEN REFINERS REPORTED IN THE 1975 SURVEY COMPARED WITH 83 IN 1967. 2/ INCLUDES MARGARINE. 3/ NOT INCLUDED IN SURVEY. N.A.--NOT AVAILABLE.

(12) did not report their storage capacity for bulk fats and oils.

Year-Round Operation

The typical production schedule for the refining industry in 1973/74 was an average 49 weeks per year, 6 days per week, 3 shifts per day, and 8 hours per shift. The average work pattern for packing operations was around 50½ weeks per year, 5 days per week, 1 to 2 shifts per day, and 8 hours per shift.

To achieve optimum practical capacity, refiners anticipated that the schedule would be stepped up to 51 weeks per year. The production and packing schedules would be affected, of course, by certain limiting factors.

Production Limitations

Refiners were asked to rank the three most important factors limiting the attainment of optimum practical output or packing.

The most important factors cited were natural gas and crude oil availability, sales demand, and deodorizing and hydrogenation capacities. Other limiting factors were downtime due to delays in getting parts and making necessary repairs, limits on availability of fuel oil, and EPA effluent guidelines for wastewater.

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1975 Speeches and Articles Available Pertaining To Fats and Oils

A copy of the following releases may be obtained from the ERS Division of Information, Room 0054 South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

"Decisionmaking In the Oilseed Processing Industry", by Harry O. Doty, Jr. Paper presented at the 21st Annual Conference of Cooperative Soybean and Cottonseed Oil Mills, at the Frontier Hotel, Las Vegas, Nevada, March 10, 1975.

The following 3 papers were presented at the First World Soybean Research Conference at the University of Illinois, Urbana-Champaign, Illinois, August 4-8, 1975:

"Intercountry Competition In the Production and Export of Soybeans", by Alan S. Walter. ERS-610.

"Trends and Patterns In Soybean Oil Use For Food and Industrial Products", by George W. Kromer. ERS-611.

"Substituting Soy Protein For Other Proteins In Feed Rations: Economic Aspects", Paul D. Velde and Charles E. Overton. ERS-612.

"Views On The 1975/76 Sunflowerseed Situation in The Soviet Union" by George W. Kromer. Reprint from Fats and Oils Situation, FOS-280, October 1975, ERS-617.

Outlook for Oilsseds, Fats and Oils" by George W. Kromer. Speech at the National Agricultural Outlook Conference, Washington, D.C., November 19, 1975.

VIEWS ON THE 1975/76 SUNFLOWERSEED SITUATION IN THE SOVIET UNION

by
George W. Kromer[1]

ABSTRACT: The area planted to sunflowers for seed in the USSR has remained relatively stable during 1973-1975 at about 4.7 million hectares. Production of seed reached a record 7.4 million metric tons in 1973 but declined to 6.8 million last year. Drought, moth damage, and cutting of some acreage for silage probably has reduced the 1975 sunflowerseed crop to an estimated 5½ to 6 million tons. This is a fourth below the 7.4 million tons planned for 1975. In order to keep crushing capacity fully utilized, because of the shortfall in sunflower seed production, the Soviets reported an interest in soybean imports of about 1½ million metric tons in 1975/76. Based on our estimates of the 1975 sunflower crop and Soviet crushing capacity, this is probably the maximum volume the USSR could effectively handle in 1975/76.

Key Words: Sunflowerseed, sunflower oil, USSR.

Sunflowerseed oil is the major edible vegetable oil produced and consumed in the USSR, followed by cottonseed oil. Soybean oil is also produced but on a much smaller scale than sunflowers (see table below). The Soviets coordinate the imports of oilseeds with the shortfall in sunflowerseed output. The soybeans are needed to keep the processing facilities fully utilized and to make more oil and protein meal available for domestic poultry and livestock feeding.

USSR production of vegetable oils from State-held reserves of oilseeds, and plan fulfilment, calendar 1974

Oil	Production	Plan	Percent of plan
	Thousand metric tons		*Pct.*
Total	3,100.7	3,055.5	101
Sunflower	2,255.0	2,224.4	101
Cottonseed	668.2	658.9	101
Linseed	39.3	37.4	105
Castor	33.2	32.4	103
Mustard	28.8	27.0	107
Corn	11.0	11.7	94
Soybean	26.5	26.0	102
Peanut	.6	1.4	43
Tung	.4	.3	112
From fruit, grape, and tomato seeds	.7	.6	112
Other	37.1	35.5	105

Source: Maslo-zhirovaya promyshlennost, May 1975, p. 25.

Soviet Sunflower Crop Off About 15 Percent

While visiting with Soviet officials in the major sunflowerseed producing areas, factors were noted that have reduced the 1975 sunflower crop prospects.

In Moldavia, moth damage and prolonged summer drought reduced the harvested area for seed to 130,000 hectares (a hectare equals 2.47 acres), about 40 percent below the sown area of earlier years. In Odessa Oblast, however, the sunflower area is down to 200,000 hectares, or 50 percent below 1974, but is in line with historical levels. In 1974, sunflower acreage expanded to 400,000 hectares, primarily on land where grain had been lost.

[1]The views expressed in this paper are mainly based on the author's visit to the USSR during September 1-20, 1975, as part of a 4-man U.S. Sunflower/Vegetable Oil delegation. The team visited European USSR including the three major sunflower producing areas of the Ukraine, Moldavia, and the Kuban (RSFSR). Also visited were oilseed processing complexes in Krasnodar and Armavir, margarine plants in Moscow and Krasnodar, and a mixed feed mill in Leningrad. The tour included two collective farms near Odessa and Kishenev. The U.S. team was invited to the Soviet Union under the auspices of the U.S.-USSR Agricultural Agreement. Other team members were George Wanamaker, FAS, leader, John Mogush, Cargill (Minneapolis), and Lars Wiedermann, Swift and Company (Chicago).

In areas visited, sunflower yields also are expected to fall below the 1974 level, with declines ranging from 6 to 14 percent. However, oil content of seeds was reportedly higher, as moisture content was below average and well below the levels of 1973 and 1974. In the southern portions of the regions a 9- to 14-day advance in harvesting was generally noted. Early harvested sunflowers in some areas did not make seed. Up to 5 percent of the crop was harvested for silage, further lowering the potential for vegetable oil production in 1975/76.

It appears that the 1975 sunflowerseed crop could fall in the area of 5½ to 6 million metric tons and State procurement of seed for processing may total around 4½ million tons. In this event, adequate crushing capacity would be available for the 1½ million tons of soybeans reportedly under consideration for import in 1975/76. While soybeans tax existing solvent extraction and de-solventizing facilities because of their high meal content, some expansion in the crushing industry has continued in recent years. Additionally, the Baltic flaxseed and Far East soybean processing capacity is being underutilized as domestic crops have fallen short of goals. The Soviets do not process soybeans in cottonseed crushing plants.

The area sown to sunflower seed, production, and procurement in the USSR in recent years and the 1975 forecasts are as follows:

Year	Area	Yield	Production[1]	Procurement[2]	
				Actual	Plan
	Mil. ha.	*Q/ha.*	*Mil. metric tons*		
1970	4.8	12.8	6.1	4.6	4.6
1971	4.5	12.6	5.7	4.4	5.3
1972	4.4	11.4	5.0	3.8	5.4
1973	4.7	15.5	7.4	5.6	5.5
1974	4.7	14.4	6.8	5.2	5.7
1975 forecast	4.5	12.2-13.3	5.5-6.0	4.2-4.7	5.9

[1] Production includes 8 percent dockage; moisture may vary from 12 percent to 18 percent. [2] Twelve percent moisture and foreign material 1 to 3 percent.

Soviet sunflowerseeds are high in oil content. Commercial oil outturns in processing run 40-44 percent. Based on State purchases of 4½ million tons of seed, the production of sunflower oil would total about 2.0 million tons compared with 2.4 million in 1974/75.

The U.S. team observed the Ilyichevsk seaport facilities which are located near Odessa on the Black Sea. This is a major USSR port facility for vegetable oils, coal, and ore, and an important area for importation of grain. In 1973, about 2 million tons of wheat were imported here and in 1974, 1.5 million tons. As there are no storage facilities for grain at the site it is moved on immediately by rail or truck.

The port has six vegetable oil storage tanks which hold an estimated 4,000 tons each. The monthly handling capacity is 30,000 tons. They have handled two 15,000-ton tankers monthly. The vegetable oil tanks have heating coils but no agitation is used.

It was interesting to note that a cargo of medium-sized Soviet farm tractors awaited loading, destined for the southern part of the United States.

Of the 1 million metric tons of U.S. soybeans shipped to the USSR in 1972/73, about one-half were received in the Black Sea ports, one-fourth in the Baltic ports, and one-fourth in the Far Eastern ports.

Sunflower Processing Facilities and Capacities

The processing plant at Armavir, one of the country's largest, has the capacity of 800 metric tons of sunflowerseed per day, or more than 250,000 tons annually. In 1974 they processed 254,000 tons of sunflowers, operating 11 months with one month down for repairs. This produced 116,000 tons of sunflower oil. The processing plant at Krasnodar was recently expanded from 500 tons per day to 600 tons per day, or 190,000 tons annually. The oil extraction equipment which was removed from Krasnodar has been sent to a nearby plant and will be used to increase the capacity of that plant. Both Armavir and Krasnodar use a pre-press operation, followed by an extraction operation to remove the maximum quantity of oil from seed. In 1973, Armavir processed 23,000 tons of U.S. soybeans and Krasnodar 10,000 tons.

In processing soybeans, Soviet sunflower capacity is sharply reduced. The Armavir plant which processed about 254,000 tons of sunflower in 1974 could only process 140,000 tons of soybeans annually. Soybeans would be dried, if necessary, then prepared and run through the pre-press operation also followed by extraction. However, as soybeans contain up to twice the cake of sunflowerseed, and about one third of the oil, the pre-press, extraction and de-solventizing equipment reduce the effective capacity for soybeans by nearly 50 percent.

There are 180 sunflower crushing plants in the Soviet Union, including 100 small rural mills. Crushing capacity has increased 20 percent over the last 7 years. Sunflowerseed processing capacity in the State sector approximated 20,000 tons daily in 1973/74, and on the basis of 316 operating days per year, would have totaled about 6.3 million tons. Based on the Soviet vegetable oil industry annual expansion of 3 percent, capacity now totals about 6.5 million tons for sunflowerseed.

Edible Oil Consumption Rising

Sunflower oil in the USSR is recovered from the seed by pre-pressing and solvent extraction. Also

on the collective farms cold-press oil is produced for local consumption. About 80 percent of the sunflower oil produced in the USSR is used for edible purposes, mostly as pre-pressed oil. Extracted oil is usually further processed for technical uses, such as in soap-making and paints, or else is exported as crude oil. The pre-pressed oil and the small quantities of cold-pressed oil produced on collective farms provide the bulk of the country's edible oil supply.

Edible vegetable oil consumption in the Soviet Union has trended upward over the past 25 years—from 2.7 kilos per person in 1950 to 7.9 kilos (17 pounds) in 1974. The Soviets recommended nutritional goal or norm is 9.1 kilos (about 20 pounds) per person. They are trying to upgrade the living standards and diets of their people. Officials feel that this can be achieved without reducing export availabilities of sunflower oil for their traditional customers. This is to come about by increasing oil yields to a ton per hectare. The highest yield of two-thirds ton per hectare was achieved in 1973.

The U.S. team observed margarine and oil processing facilities in Moscow and in Krasnodar, and discussed Soviet edible oil research and development activities at the All-Union Research Institute of Fats and Oils (VINIISH) in Leningrad.

The basic interests of Soviet scientific groups are very similar to those of the U.S. However, the immediate requirements of the Soviet vegetable oil industry are quite different, because of the short time span from product manufacture to consumer purchase and use, usually not over one month for semi-perishable products such as margarine and mayonnaise. This eliminates the need for sophisticated packaging and optimum oil processing. In the United States the shelf-life for these products is 4 to 6 months.

The Soviet Union consumes slightly more commercial butter than margarine per person. They probably also consume more farm butter. However, the manufacture of margarine is steadily increasing. The Soviets produce about 16 brands of margarine with an 82 percent fat content. Package sizes are 200 and 250 grams. Margarine stocks include hydrogenated fats and liquid oils such as sunflower, cottonseed, soybean, peanut, coconut, and 100 percent cultured whole milk. The two best brands contain butter and coconut oil, respectively.

Solvent extracted soybean oil is traditionally used for edible purposes in the Soviet Far East. Past practices in the Soviet European area have been to use soybean oil only for industrial purposes. The Soviets have the technology and facilities to use soybean oil in edible products in the traditional sunflower oil areas. In the United States virtually all the soybean oil is produced by solvent extraction, over 90 percent of which is utilized in food products.

Mixed Feed Plant in Leningrad

A completely automated mixed feed complex was visited in Leningrad, one of the largest in the USSR. The capacity of this plant is being increased from 650 tons per day to 1,000 tons per day in 1976. About 75 percent of the feeds produced at this plant are for poultry; 18 percent for hogs, cattle, and fish; and 7 percent for milk cows. The minimum protein content for broilers and chickens is 20 percent. About 2 to 4 percent fat is added to the prepared feeds for poultry. At the time of our visit the plant was producing pellet feeds for hogs and chickens. In the Soviet Union, about 35 percent of the mixed feeds are pelleted. Total mixed feed output in the Nation is about 37 million tons. Soybean meal is recognized as a preferred feed ingredient but only relatively small quantities are available in the European sector of the USSR.

The Soviets recognize their protein deficit problem and are attempting to solve it through upgrading protein content of their domestically produced grains rather than importation of soybeans or soybean meal. Soybean imports will continue to be favored over meal imports as long as the Soviets stress domestic processing and industrial oil requirements exceed supplies. However, when requirements for protein for the mixed feed industry increase more rapidly than can be met by protein produced from domestic or imported oilseeds, meal imports as such may be required, perhaps in the latter phase of the 1976-1980 plan.

Soviet Soybeans

Soybeans in the USSR are produced primarily in the Far Eastern part of the country. About 800,000 to 900,000 hectares are sown annually with a production of around 400,000 tons for soybeans. There is little opportunity to expand soybean production in this area because of the limited land available, shortfall in moisture, limited sunlight, and short growing season. Soybeans need to be planted within 2 or 3 days and harvested within 4 or 5 days of certain dates. Because acreage cannot expand in the Far East, research is being directed toward increased soybean yields per hectare. The Soviets have collected seed varieties from around the world.

The Scientific Institutes are making efforts to increase soybean production in the European sector. Here yields have been too low to compete with sunflowers. Soybean growing is still in the scientific stage. Increased acreages are expected in the Ukraine, Moldavia, Georgia, and the lower regions. This acreage will be irrigated. Acreage in European sectors was placed at 3,000 to 4,000 hectares, mainly for silage. This is about 3 percent of the total soybean acreage in the USSR.

Costs of Production for Soybeans, Peanuts, and Flaxseed for 1974, 1975, and 1976

by Alan S. Walter and Gail D. Garst*

ABSTRACT Regional and U.S. average costs of production for soybeans, peanuts, and flaxseed for 1974, 1975, and 1976 have been estimated with the use of a computerized budgeting system. The per acre costs of growing these crops have been increasing due to rising input prices. As a result of increase in yields, per unit costs of production in 1975 decreased for soybeans and flaxseed and increased only slightly for peanuts. Per unit costs for 1976 will depend upon actual crop yields. Therefore, the 1976 projections in this report are shown as a range to reflect the uncertainty in yields.

KEYWORDS: Soybeans, peanuts, flaxseed, costs of production.

Substantial interest is currently being shown in the costs of producing agricultural commodities. While the prices of inputs have been observed to increase in recent years, the trend of average per unit production costs is not well known. This report presents estimates of the average costs of production for peanuts, soybeans, and flaxseed in several regions for 1974 and 1975 as well as projections for 1976.[1]

Cost estimates for the crops in this report were made with the use of a computerized system at Oklahoma State University. The procedure used was to develop a set of base budgets for 1974 which could be easily updated to reflect conditions in succeeding years. Land and management charges were not included for this report.

Data from several sources were used. A cost of production survey for crops grown in 1974 provided necessary information on cultural practices; size, type, and use of machinery; quantities of fertilizer and seed; and use of chemicals.[2] Since these items generally change slowly from year to year, they are held constant for the 3 years shown in this report. Other items such as crop yields, fertilizer, chemical and seed prices, labor rates, custom rates, and machinery costs which can vary substantially in a short period of time required annual revision. Data published or estimated by the Statistical Reporting Service or ERS were used for these revisions.

The following table shows indices of prices of major inputs as used in the budgets for 1975 and 1976 based upon an index of 100 for 1974. All items increased in cost in 1975 except short-term interest rates. Projected costs for 1976 are higher than for 1975 for all items except short-term interest rates, which dropped for the last 2 years, and fertilizer.

Indices of prices of selected production items: Estimated for 1975 and projected for 1976[1]

Item	1975	1976
	1974=100	
Motor supplies[2]	109	118
Farm machinery[3]	124	137
Fertilizer	115	107
Farm supplies[4]	116	126
Wages	110	120
Custom rates[5]	121	135
Drying costs[6]	113	123
Interest-short term	94	91

[1] These figures were generally estimated by ERS. [2] Used in the budgets to adjust fuel and lubricant costs for 1975 and 1976. [3] Used to calculate replacement and repair costs. [4] Used to adjust pesticide costs for 1975 and 1976. [5] Assumed to consist of 86 percent machinery costs, 8 percent fuel, and 6 percent labor. [6] Assumed to consist of 65 percent fuel, 25 percent machinery costs, and 10 percent labor.

*Agricultural Economists with Commodity Economics Division, Economic Research Service in Washington, D.C. and Stillwater, Oklahoma, respectively.

[1]These results are based upon *Costs of Producing Food Grains, Feed Grains, Oilseeds, and Cotton* by Ronald Krenz, Gail Garst, Charles Micheel, Dave Fawcett, and Stan Rodgers to be published by ERS.

[2]Printed by Senate Committee on Agriculture and Forestry. *Costs of Producing Selected Crops in the United States—1974*, Committee Print 63-092, Government Printing Office, Washington, D.C., 1976.

Prices of farm machinery showed the greatest increase followed by the farm supplies index used in calculating chemical costs.

The costs shown in this report reflect geographic coverage, data sources, and computation procedures which are not entirely comparable to those of the ERS cost of production survey. For example, the survey represented 78 percent of the soybeans produced (74 percent of harvested acreage) compared to 97 percent of production in this report. The U.S. averages shown in this report represent 96 percent of the flaxseed and 99 percent of the peanuts produced in this country. Per acre costs in this report refer to a planted acre instead of a harvested acre as used in the survey tending to lower the costs in this report somewhat. Some differences in assumptions have also been used in this report in calculating fuel and machinery replacement charges. These differences in coverage, data, and procedure generally resulted in only minor differences in the resulting cost estimates for the base year, 1974.

RESULTS

Soybeans

Costs of production for soybeans in four regions are shown in table 23. The Lake States-Corn Belt region has a cost structure similar to the adjacent Northern Plains. These two regions, which account for two-thirds of the U.S. production, have the lowest average costs (excluding land and management) on both a per acre and a per bushel basis.

The U.S. average per bushel costs for most categories actually decreased in 1975 from 1974 as a result of the 5 bushel larger yield in 1975 but are projected to increase in 1976. Total per acre costs for 1976, excluding land and management, are projected to reach $70, an increase of $4 or 7 percent over 1975.

Peanuts

Peanut production is centered in three regions in the United States. The southeastern area, which produces over 60 percent of the U.S. crop, has the highest per acre production costs, as shown in table 24, but the lowest per pound costs due to high average yields. Conversely, the Southern Plains, or Southwestern area, because of relatively low yields has the highest per pound costs even with the lowest per acre costs. Costs shown for the Southern Plains are weighted averages of irrigated and non-irrigated production. The Virginia-North Carolina area has per acre costs slightly lower than for the Southeast, but per pound costs are higher due to lower yields.

The projected U.S. average of variable costs for 1976 is $204 per acre, $29 or 17 percent above 1974. Machinery ownership costs show a projected 26 percent increase for the same period. The total of all costs shown, including the peanuts share of farm overhead, increased by $40 per acre, or 18 percent, in the 2 years, wih more of the increase occurring between 1974 and 1975 than from 1975 to 1976.

Costs per pound are also shown in table 24 with a range in projected costs shown for 1976 that coincide with a range in projected yields. Yield increases cause the per pound costs to increase at a lesser rate than the comparable per acre costs. At the midpoint of the 1976 yield projection variable costs for the U.S. are only 5 percent higher than 1974 and 2 percent over 1975.

Flaxseed

Estimates of the costs of production for flaxseed in the region comprised of North Dakota, South Dakota, and Minnesota are shown in table 24. This area produces 96 percent of the U.S. flaxseed. Production costs have increased at a slower rate from 1974 to the present for flaxseed compared to most crops due primarily to low applications of fertilizer and chemicals as well as a drop in the price of flaxseed used for seed. Per acre variable costs for 1975 remained about the same as 1974 at $25 per acre with a slight increase likely for 1976. Machinery ownership costs have shown a greater rate of increase than variable costs, rising a projected $5 between 1974 and 1976.

Per bushel costs for flaxseed show extreme variability from year to year because of large variations in yields. As a result of low yields 1974 variable costs were substantially higher per bushel than both 1975 and projected 1976 costs.

Table 23.--Soybeans, regional and U.S. averages of costs of production for 1974, 1975, and projections for 1976

Item	Lake States and Corn Belt			Northern Plains			Southeast			Delta			U.S.		
	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976
Costs per planted acre:															
Variable costs:															
Seed	7.57	8.60	8.60	7.56	7.84	7.84	7.99	8.36	8.36	7.89	9.21	9.21	7.69	8.63	8.63
Fertilizer	3.45	4.77	4.45	1.06	1.48	1.39	10.16	13.45	12.55	3.45	5.10	4.77	4.37	6.01	5.61
Lime	.46	.46	.46	.32	.32	.32	1.80	1.80	1.80	.60	.60	.60	.69	.69	.69
Chemicals 1/	6.41	7.45	8.08	4.95	5.75	6.23	10.91	12.67	13.74	8.86	10.29	11.15	7.45	8.66	9.39
Custom operations 2/	1.72	2.08	2.32	2.38	2.87	3.20	3.94	4.76	5.30	.82	1.00	1.11	1.95	2.35	2.62
Labor (all)	6.38	7.35	8.11	5.41	5.92	6.44	6.70	7.38	8.07	5.75	6.34	6.93	6.27	7.11	7.82
Fuel and lub.	3.78	4.27	4.68	3.10	3.30	3.58	4.73	5.29	5.74	4.55	5.01	5.44	4.03	4.51	4.91
Repairs	3.28	4.28	4.77	2.52	3.13	3.46	3.74	4.64	5.13	3.72	4.61	5.10	3.39	4.33	4.82
Interest	1.21	1.35	1.37	.79	.86	.87	1.77	1.98	1.96	1.45	1.58	1.58	1.31	1.46	1.47
Total variable costs	34.26	40.61	42.84	28.09	31.47	33.33	51.74	60.33	62.65	37.11	43.74	45.89	37.15	43.75	45.96
Machinery ownership costs:															
Replacement	6.99	9.62	11.07	7.42	9.20	10.17	8.12	10.06	11.12	10.40	12.90	14.25	7.77	10.23	11.57
Interest	3.65	4.15	4.42	3.73	3.97	4.09	4.40	4.50	4.61	5.73	5.62	5.77	4.12	4.44	4.66
Taxes & insurance	.85	1.01	1.12	.97	1.05	1.13	1.04	1.12	1.19	1.29	1.38	1.48	.96	1.09	1.19
Total ownership costs	11.49	14.78	16.61	12.12	14.22	15.39	13.56	15.68	16.92	17.42	19.90	21.50	12.85	15.76	17.42
General farm overhead	5.22	5.82	6.22	6.33	7.06	7.54	4.66	5.19	5.55	4.99	5.56	5.94	5.19	5.79	6.19
Total of above	50.97	61.21	65.67	46.54	52.75	56.26	69.96	81.20	85.12	59.52	69.20	73.33	55.19	65.30	69.57
Yield per acre (bu.) 3/	24.2	31.0	30.0-32.0	21.3	23.2	23.2-25.2	21.9	22.5	21.5-23.5	20.1	22.9	21.4-23.4	23.0	27.9	26.9-28.9
Costs per bushel:															
Variable 4/	1.42	1.31	1.43-1.34	1.32	1.36	1.44-1.32	2.37	2.68	2.91-2.67	1.84	1.91	2.14-1.96	1.62	1.57	1.71-1.59
Machinery ownership	.48	.48	.55-.52	.56	.61	.66-.61	.62	.70	.79-.72	.86	.87	1.00-.92	.56	.57	.65-.60
General farm overhead 4/	.21	.19	.21-.19	.30	.31	.32-.30	.21	.23	.26-.24	.26	.24	.28-.25	.23	.20	.23-.21
Total of above 4/	2.11	1.98	2.19-2.05	2.18	2.28	2.42-2.23	3.20	3.61	3.96-3.63	2.96	3.02	3.42-3.13	2.41	2.34	2.59-2.40
Percent of U.S. production	63.4			4.6			14.4			14.4			96.9		

1/ Includes herbicide, insecticide, and rodenticide materials not otherwise included under "Custom operations."
2/ Includes custom application of crop chemicals, custom harvesting and hauling, and all drying.
3/ Projected yields for 1976 are shown with ranges.
4/ Projected costs for 1976 are shown with ranges to coincide with the yield ranges.

Table 24--Peanuts and flaxseed, cost of production for 1974, 1975, and projections for 1976

Item	Peanuts												Flaxseed 5/		
	Virginia-North Carolina			Southeast			Southern Plains			Total U.S.			Total U.S.		
	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976
	Dollars														
Costs per acre:															
Variable costs:															
Seed	46.64	43.10	43.10	41.18	38.50	38.51	33.46	30.69	30.69	39.94	37.08	37.08	9.39	7.23	7.23
Fertilizer	9.19	12.17	11.35	13.45	17.25	16.11	12.83	17.25	16.08	12.49	16.32	15.23	1.03	1.42	1.32
Lime	14.82	14.82	14.82	13.62	13.62	13.62	.47	.47	.47	10.04	10.04	10.04	1.27	1.48	1.61
Chemicals 1/	59.29	68.84	74.65	50.72	58.89	63.86	33.97	39.44	42.77	47.45	55.08	59.73	1.26	1.52	1.69
Custom operations 2/	19.37	21.78	24.82	30.28	36.78	41.30	17.61	21.89	24.58	24.62	29.73	33.45	4.73	5.21	5.70
Labor (all)	20.02	21.56	23.16	15.55	17.14	18.74	13.14	14.45	15.78	15.68	17.17	18.68	3.08	3.30	3.58
Fuel and lub.	10.87	12.04	13.07	10.27	11.42	12.40	9.83	10.77	11.68	10.25	11.35	12.31	3.10	3.84	4.25
Repairs	9.48	11.76	12.99	10.52	13.05	14.42	6.97	8.64	9.56	9.31	11.54	12.75	.05	.05	.05
Miscellaneous expenditures	---	---	---	---	---	---	1.72	1.72	1.72	.50	.50	.50	.72	.71	.72
Interest	4.66	4.85	4.83	4.67	4.89	4.88	3.65	3.93	3.93	4.38	4.61	4.60	24.63	24.76	26.15
Total variable costs 3/	194.34	210.92	222.79	190.26	211.54	223.84	133.66	149.25	157.26	174.66	193.42	204.37	7.30	9.05	10.00
Machinery ownership costs:															
Replacement	14.04	17.41	19.24	15.72	19.49	21.54	17.57	21.77	24.08	15.95	19.77	21.85	3.65	3.84	3.94
Interest	7.82	8.13	8.34	8.94	9.14	9.38	8.73	9.53	10.02	8.67	9.07	9.37	.88	.94	1.00
Taxes and insurance	1.92	2.06	2.20	2.16	2.31	2.47	2.75	3.15	3.43	2.29	2.51	2.70	11.83	13.83	14.94
Total ownership costs	23.78	27.60	29.78	26.82	30.94	33.39	29.05	34.45	37.53	26.91	31.35	33.92	3.86	4.31	4.60
General farm overhead	15.34	17.10	18.27	17.74	19.78	21.13	8.46	9.43	10.08	14.65	16.34	17.44	40.32	42.90	45.69
Total of above	233.46	255.62	270.84	234.82	262.26	278.36	171.17	193.13	204.87	216.22	241.11	255.73			
Yield per acre 4/	2,551	2,546	2,557-2,753	2,915	3,160	3,166-3,362	1,478	1,655	1,642-1,838	2,433	2,612	2,614-2,810	7.6	9.6	8.6-10.7
Costs per unit 4/															
Variable	.076	.083	.087-.081	.065	.067	.071-.067	.090	.090	.096-.086	.072	.074	.078-.073	3.23	2.58	3.04-2.44
Machinery ownership	.009	.011	.012-.011	.009	.010	.011-.010	.020	.021	.023-.020	.011	.012	.013-.012	1.55	1.44	1.74-1.39
General farm overhead	.006	.006	.007-.006	.006	.006	.007-.006	.006	.006	.006-.005	.006	.006	.007-.006	.51	.45	.53-.43
Total of above	.091	.100	.106-.098	.080	.083	.089-.083	.116	.117	.125-.111	.089	.092	.098-.091	5.29	4.47	5.31-4.26
Percent of U.S. production	18.9			62.5			17.4			98.8			95.8		

1/ Includes herbicide, insecticide, and rodenticide materials not otherwise included under "Custom Operations."
2/ Includes custom application of crop chemicals, custom harvesting and hauling, and all drying.
3/ Does not include grading, handling or inspection charges.
4/ The unit for peanuts is pounds, farmers' stock basis. Flaxseed is on a per bushel basis.
5/ Includes production for North Dakota, South Dakota, and Minnesota.

FORECASTING RETAIL MARGARINE PRICES

by Paul D. Velde
and Stanley A. Gazelle[1]

ABSTRACT: While margarine is the major table spread consumed in the United States, retail margarine prices varied considerably during the 1970-1976 period. And, even though vegetable oils are its major ingredients, the fact that soybean oil is the largest ingredient used and is a major price factor makes it a reliable indicator of ingredient cost movements. A statistical analysis regressing monthly retail margarine prices against the prices of soybean oil, retail butter prices, and real personal income (each with weighted-monthly moving-averages and lags) explained 98 percent of the monthly variation in margarine prices. Forecasts of retail margarine prices using updated coefficients implied fairly consistent results for up to three months ahead.

KEYWORDS: Margarine, butter, soybean oil, price forecasts.

Margarine is the major table spread consumed in the United States today competing primarily with butter. A recent study of the annual relationships among margarine, butter, and other fats and oils in the U.S. indicates that ingredient costs and retail butter prices are major determinants of retail margarine prices. An equation relating these two variables to margarine price explained 84 percent of the annual variation in retail margarine prices for the base period 1960-1973.[2]

A logical corollary suggests estimating temporal or short term price fluctuations within a year. This paper estimates the above relationships using monthly data for the years 1970-75. This period was one of the most volatile for prices in several decades. Even though price controls[3] were in effect during a large part of the period under study, their effect appeared minimal in restricting fluctuations of retail margarine prices. However, a change in the import quota levels for dairy products in October 1973 significantly reduced the retail price of butter.[4]

The retail price of margarine logically should depend largely on (1) the cost of ingredients, (2) prices of substitute products, and (3) consumer's real income.

To test the validity of the "cost of ingredients" variable, several alternative variables were constructed and tried with varying weights and lags: (1) a weighted moving-average soybean oil price variable;[5] (2) a weighted moving-average oil price using five major oil ingredients; and (3) a weighted moving-average oil price using 10 fats and oils used in the production of margarine. Statistical results using the above as an indicator of ingredi-

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[2]Gazelle, Stanley A. and Paul D. Velde, "Margarine Consumption and Prices," ERS 560, Economic Research Service, USDA, Washington, D.C., June 1974.

[3]Price controls were in effect with varying rules during: (1) (Aug. 15, 1971-Nov. 13, 1971), (2) Phase II (Nov. 14, 1971-Jan. 10, 1973), (3) Phase III (Jan. 11, 1973-June 12, 1973), (4) Freeze II (June 13, 1973-July 18, 1973), (5) Phase IV (July 19, 1973-April 30, 1974).

[4]USDA, "The Impact of Dairy Imports on the U.S. Dairy Industry" ERS-Agric. Economic Report No. 278, January 1975, pp. 2-3.

[5]The weighted moving-averages were calculated as follows:

P^1 Times Q^1 + P^2 Times Q^2 +...+ Pn Times Qn ÷ Q^1 + Q^2 +...+ Qn
where P^1 and Q^1 are the currently observed period and Pi and Qi,
i = 2,...,n are the adjacent historical periods.

TABLE 34 --U.S. RETAIL PRICES FOR MARGARINE, ACTUAL AND ESTIMATED, BY MONTHS AND CALENDAR YEARS, 1970-76

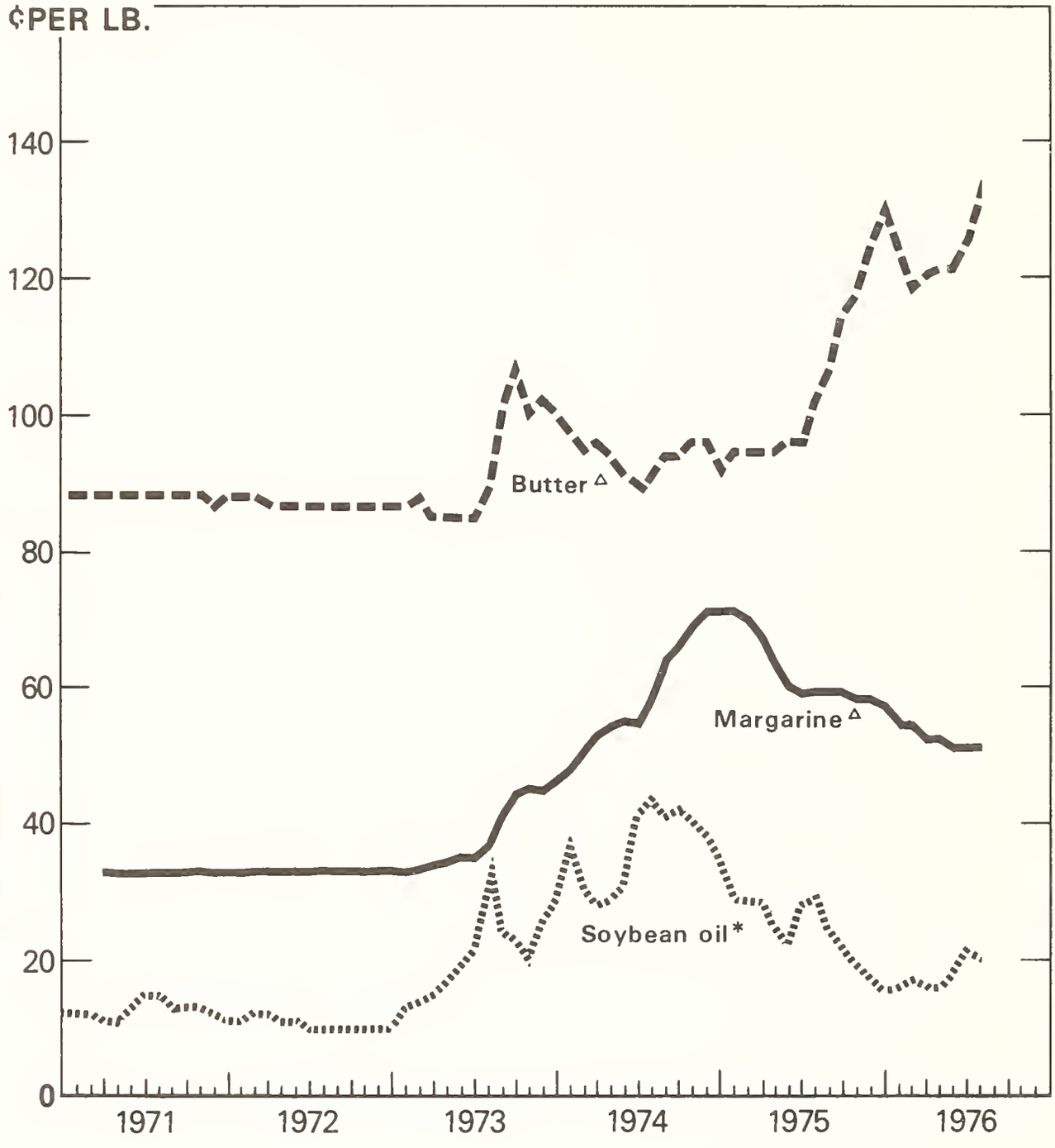
YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE
						CENTS PER POUND							
						ACTUAL							
1970	28.4	28.4	28.5	29.2	29.9	30.1	30.1	30.1	30.2	30.6	31.0	31.6	29.8
1971	32.0	32.0	32.1	32.5	32.7	32.6	32.6	32.8	33.2	33.3	33.2	33.2	32.7
1972	33.0	33.3	33.4	33.3	33.2	33.3	33.0	33.0	33.1	33.0	32.9	32.9	33.1
1973	32.6	32.7	32.9	33.5	34.0	35.1	35.2	36.8	41.2	44.3	45.1	45.1	37.4
1974	45.9	48.2	51.3	53.3	53.8	54.7	54.5	57.5	63.7	66.4	69.3	70.7	57.4
1975	71.4	70.8	69.7	67.4	63.4	60.4	59.2	58.5	58.9	58.9	58.3	57.5	62.9
1976	56.6	54.3	53.5	51.7	51.6	51.1	51.1	50.7					
						ESTIMATED 1/ 2/							
1970	---	---	---	---	---	---	---	---	---	---	---	---	---
1971	32.1	32.5	32.8	33.1	32.9	32.5	32.5	32.6	33.2	33.7	34.1	34.6	33.1
1972	34.5	34.1	33.4	33.2	33.0	32.9	32.8	32.8	32.7	32.4	32.0	31.7	33.0
1973	31.6	31.6	31.7	32.3	33.2	34.4	36.0	37.9	40.0	44.1	46.3	48.5	37.3
1974	49.9	51.8	51.9	55.1	57.5	60.0	61.5	62.7	63.6	65.5	67.1	69.7	59.7
1975	70.8	69.9	67.7	65.1	62.0	59.5	57.0	55.1	55.1	55.1	54.9	55.0	60.6
1976	55.3	54.8	52.5	52.1	53.3	54.3	55.3	56.6					
						DIFFERENCE 2/							
1970	---	---	---	---	---	---	---	---	---	---	---	---	---
1971	-.1	-.5	-.7	-.6	-.2	.1	.1	.2	0.0	-.4	-.9	-1.4	-.4
1972	-1.5	-.8	0.0	.1	.2	.4	.2	.2	.4	.6	.9	1.2	.1
1973	1.0	1.1	1.2	1.2	.8	.7	-.8	-1.1	1.5	.2	-1.2	-3.4	.1
1974	-4.0	-3.6	-.6	-1.8	-3.7	-5.3	-7.0	-5.2	.1	.9	2.2	1.0	-2.3
1975	.6	.9	2.0	2.3	1.4	.9	2.2	3.5	3.8	3.8	3.5	2.5	2.3
1976	1.3	-.5	1.0	-.4	-1.7	-3.2	-4.2	-5.9					

1/ BASED ON THE EQUATION DESCRIBED IN THE TEXT.

2/ THERE ARE NO ESTIMATES FOR THE MONTHS OF JANUARY 1970 THROUGH JANUARY 1971 DUE TO USE OF WEIGHTED MOVING AVERAGES AND LAGGED DATA.

U.S. PRICES FOR MARGARINE, BUTTER AND SOYBEAN OIL

By Months



*WHOLESALE PRICE, CRUDE, DECATUR. △RETAIL PRICE, IN SPECIFIED CITIES.

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ent cost with other variables were basically the same in all three cases. Thus, the weighted moving-average soybean oil price variable was used as an accurate representative of ingredient costs in margarine production.[6]

All the ingredient variables examined were tested with shorter and longer weighted moving-averages and different monthly lags.[7] Shorter and longer weighted moving-averages were also applied to the substitute product prices and real income variables. These behavioral relationships were also tested for different monthly lags for the weighted moving-averages of butter prices and real incomes in explaining the retail price of margarine. The combination of weighted moving-average which was then lagged for each of the variables which most significantly reduced unexplained variation in the overall equation was selected. If the behavioral characteristics of the margarine industry should change, the relationship will need to be respecified and re-estimated.

In order to forecast the monthly retail prices of margarine, the following relationship was estimated:

RMP = (WPSB05-2, WRBP10-3, RPI3-1)

Where

RMP = retail margarine prices in cents per pound, monthly.

WPSB05-2 = a 5-month weighted moving-average of crude soybean oil prices which was then lagged 2 months; in cents per pound, monthly.

WRBP10-3 = a 10-month weighted moving-average of retail butter prices which was then lagged 3 months, in cents per pound, monthly.

RPI3-1 = a 3-month simple moving-average of real personal income in billion dollars in the U.S. which was lagged 1 month.

Statistical Results

Monthly data beginning in January 1970 through November 1975 were used to estimate coefficients in the following equation:

$$RMP = -53.73 + 1.10\ WPSB0\ 5\text{-}2 + 0.66 WRBP10\text{-}3 + 0\ .02RP13\text{-}1$$
$$(.06) \qquad (.15) \quad (.01)$$

$R2 = .9764$

$S.E. = 2.18$

The numbers in parentheses are the standard errors of the regression coefficients. All of the variables were significant at the .05 level in explaining variations in the retail price of margarine and the signs of the coefficients were consistent with expected relationships. The positive sign on the coefficient for the weighted and lagged soybean oil price indicates that as the cost (price) of the ingredient increases, the price of margarine increases.

The weighted 5-month moving-average soybean oil price with a 2-month lag most nearly captured the casual interrelationships involved with ingredient costs, such as the delay between the time of purchase (in the futures market) and the sale and use of the ingredient when sold as margarine. Such relationships are common in the margarine production industry.

The positive sign on the butter price coefficient indicates that as the price of butter increases (decreases), the price of margarine increases (decreases). This relationship is consistent with the effect of changes in the price of a substitute product.

During the period November 1973 to August 1974, retail butter prices generally were falling, due to weak sales and larger butter imports, after increasing 20 cents per pound in 3 months. Simultaneously, wholesale prices of fats and oils were rising. Thus, the retail price for margarine was "squeezed" between these two counteracting forces. For a while, retail prices for some of the more expensive brands of margarine were above butter prices, with butter assuming the role of the "lower-priced spread."

The final effect resulted in higher margarine prices, but the wholesale prices of fats and oils rose faster and narrowed the spread between the cost of production and the retail price of margarine. This upward pressure from ingredient costs more than offset any tendency toward weaker prices as a result of declining butter prices and the substitute product relationship.

The demand for margarine continued relatively strong even at the higher price levels. Had margarine prices continued to rise and remain above butter prices for an extended period of time, a significant shift back to butter consumption could have occurred. For calendar years 1973 through 1975, domestic disappearance of margarine on an annual basis increased slightly, although at smaller rates than in the immediate preceding years. In 1974, commercial sales of butter increased 8 percent and in 1975 increased around 3 percent.

The positive sign on the real personal income coefficient indicates that as real income increases, the retail price of margarine increases. This relationship is also consistent with changes hypothesized in economic theory. Together these 3 variables explained 97.6 percent of the monthly

[6]The statistical results are indicative of the nearly perfect degree of technical substitutibility among the fats and oils used in margarine production.

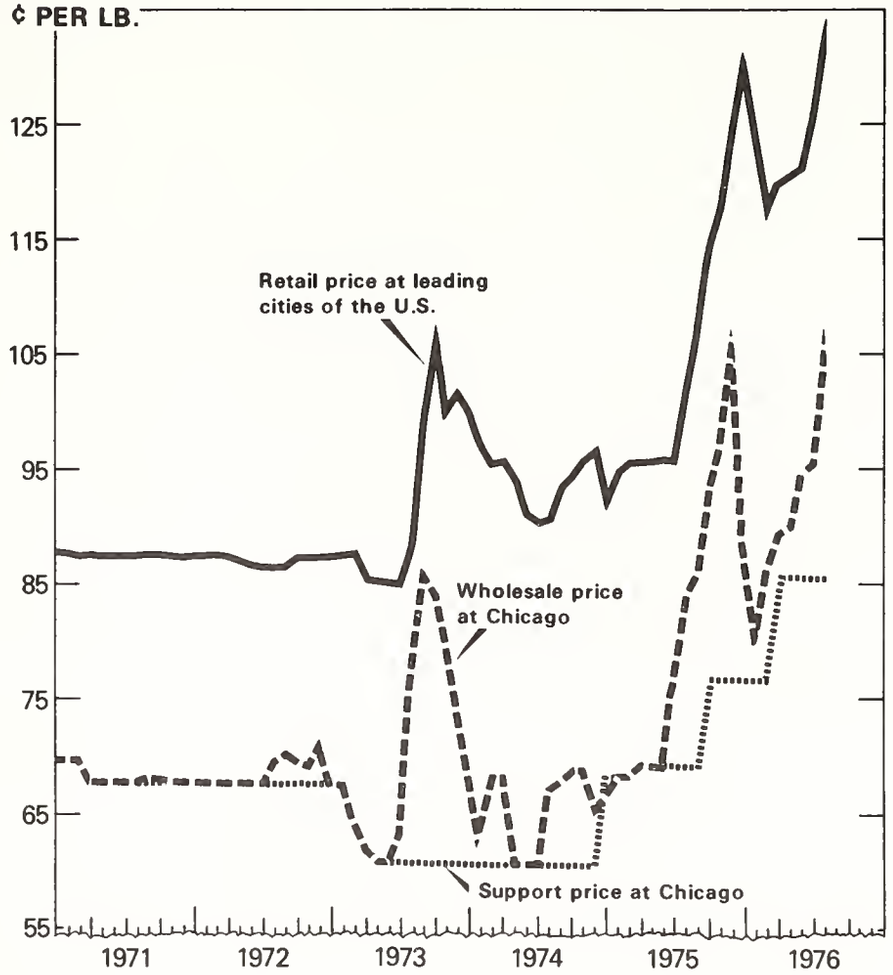
[7]Lags were applied after the weighted moving-averages were calculated.

TABLE 35--WHOLESALE PRICES OF SELECTED FOOD FATS, BY MONTHS AND CALENDAR YEARS, 1970-76

YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	AVERAGE
	CENTS PER POUND												
	SOYBEAN OIL (CRUDE, DECATUR)												
1970	9.60	11.50	12.20	12.20	11.30	11.10	11.50	11.60	12.10	14.00	13.90	12.40	11.95
1971	12.30	12.10	12.20	11.20	11.40	12.80	14.50	14.50	12.80	13.20	12.50	11.70	12.60
1972	10.90	11.00	11.70	11.90	11.40	10.70	10.30	10.10	9.80	9.60	9.60	9.70	10.56
1973	10.10	13.00	13.90	15.00	17.10	19.30	22.40	33.50	24.30	23.10	20.40	26.00	19.84
1974	28.60	36.40	30.20	28.20	29.40	31.60	40.50	43.30	40.70	42.30	40.40	38.00	35.80
1975	33.60	29.40	29.10	28.20	23.60	23.30	27.50	28.50	24.40	21.40	18.90	16.80	25.39
1976	16.17	16.33	16.56	16.32	15.77	17.62	20.87	20.35					
	COTTONSEED OIL (CRUDE, VALLEY)												
1970	11.03	11.88	13.06	13.95	14.28	14.38	14.17	13.60	12.47	13.56	14.00	14.20	13.38
1971	15.11	15.97	15.92	15.22	15.03	15.27	16.16	16.50	15.60	14.31	13.56	13.42	15.17
1972	12.84	12.25	11.95	12.69	12.35	11.94	11.31	11.10	10.56	10.00	10.30	10.62	11.49
1973	11.05	13.88	14.25	15.31	17.85	20.00	19.75	32.00	23.25	21.30	19.50	25.62	19.48
1974	28.90	35.00	33.00	35.12	36.80	36.75	41.30	46.25	40.25	44.20	42.00	38.00	38.13
1975	34.38	30.50	28.12	27.62	23.00	23.62	28.50	31.50	29.12	25.83	22.50	21.88	27.21
1976	23.75	25.63	26.30	24.12	19.25	20.33	24.88	23.30					
	CORN OIL (CRUDE, MIDWESTERN MILLS)												
1970	15.50	16.40	15.50	14.80	15.30	15.00	14.80	15.50	16.00	17.80	19.50	21.50	16.47
1971	22.50	27.50	21.00	17.00	18.80	19.50	19.30	18.90	17.80	17.80	19.00	18.00	19.76
1972	18.00	17.30	17.30	17.00	17.50	16.30	15.00	14.50	15.30	16.00	15.80	16.50	16.38
1973	17.80	17.30	17.80	17.50	19.00	21.00	20.80	35.00	23.00	24.00	25.50	32.00	22.56
1974	39.00	45.00	39.50	33.00	38.50	38.00	38.00	47.50	38.00	45.00	45.00	42.00	40.71
1975	44.00	40.50	39.00	37.00	27.00	26.50	29.50	31.00	28.00	29.00	28.50	28.50	32.38
1976	32.50	28.50	26.50	23.30	19.80	22.00	26.00	23.50					
	LARD (TANKS, LOOSE, CHICAGO)												
1970	11.10	11.70	13.60	11.80	11.60	10.90	10.90	11.50	11.50	11.80	12.50	10.80	11.64
1971	9.50	10.00	11.80	11.30	10.80	10.00	11.30	12.00	11.10	10.80	10.60	9.80	11.75
1972	9.60	11.30	11.00	10.50	10.40	10.30	10.00	10.00	10.30	10.50	11.00	9.60	10.38
1973	9.50	10.50	14.50	15.00	16.10	18.80	19.50	37.50	25.00	27.00	21.50	22.50	19.78
1974	24.00	27.00	27.00	23.00	23.00	20.80	23.50	33.00	26.50	39.00	37.00	38.50	28.53
1975	37.00	30.00	28.00	28.50	28.50	24.00	38.00	36.00	37.50	35.00	30.00	18.50	30.92
1976	17.00	17.40	17.00	15.80	15.60	16.00	19.00	19.30					
	BUTTER (GRADE A, 92° BULK, CHICAGO)												
1970	67.60	67.60	68.00	69.80	69.80	69.80	69.80	69.80	70.50	70.10	69.90	70.40	69.43
1971	69.80	69.80	69.80	67.80	67.80	67.80	67.80	67.80	68.10	68.00	67.90	67.90	68.36
1972	67.80	67.80	67.80	67.70	67.70	67.70	67.80	69.50	70.20	69.40	69.20	70.50	68.59
1973	67.70	67.70	64.20	61.60	61.00	61.00	63.40	78.20	85.90	79.30	75.00	73.00	69.83
1974	68.50	64.10	68.10	68.20	60.50	60.60	60.80	67.10	67.70	68.80	68.90	65.30	65.72
1975	66.80	68.10	68.10	69.20	69.20	69.20	76.20	83.60	85.70	93.00	97.00	105.00	79.23
1976	86.55	80.66	86.06	89.39	89.80	94.58	95.58	106.57					

U.S. BUTTER PRICES, RETAIL, WHOLESALE, AND SUPPORT PRICE

By Months



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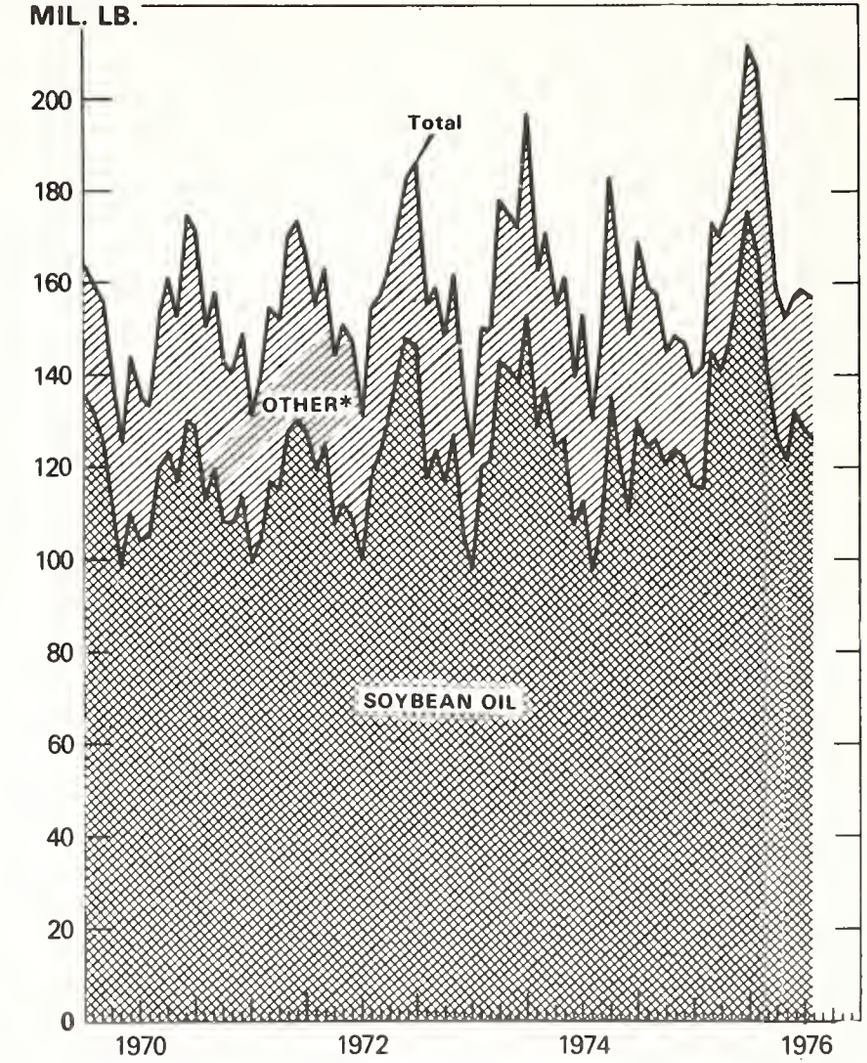
U.S. FATS AND OILS USED IN THE MANUFACTURE OF MARGARINE

By Months



*INCLUDES CORN, COTTONSEED, PALM, SAFFLOWER, PEANUT, COCONUT, PALM KERNEL OILS, AND BEEF FATS (LARD AND EOIBLE TALLOW).

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variations in the retail price of margarine during the January 1970 to November 1975 base period.

Table 34 compares the actual monthly average retail price of margarine for the period 1970 to 1975 with the estimated price as calculated by the estimating equation. A test of the reliability of the equation to forecast retail margarine prices monthly was conducted for the period of December 1975 through August 1976 using known values for the explanatory variables. The data base was updated by adding 1 additional month of data six times. The coefficients were re-estimated. The new coefficients were then used to forecast retail margarine prices through August 1976. Although this was a limited test period, the equation consistently forecasted 3 months with a fair degree of accuracy. The necessity of continually updating the coefficients was clearly demonstrated by the fact that the reliability of the forecasts declined the further they were extended from the data base.

TABLE 36 --PRODUCTION OF SOLID FOOD FAT PRODUCTS, BY MONTHS AND CALENDAR YEARS, 1970-76

ITEM AND YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL 1/
	MILLION POUNDS												
	TABLE SPREADS (ACTUAL WEIGHT)												
MARGARINE:													
1970	202.5	198.4	190.3	169.4	157.9	181.1	169.7	166.8	189.6	200.9	187.2	216.7	2,230.4
1971	212.9	189.0	195.9	181.0	176.4	185.9	163.4	173.3	194.7	188.2	210.1	219.4	2,290.2
1972	207.9	194.9	202.0	181.5	186.5	186.3	164.4	194.7	197.3	203.8	216.1	228.7	2,364.1
1973	232.6	191.7	198.7	184.4	200.3	168.5	151.8	187.7	185.8	224.2	218.2	215.1	2,359.0
1974	248.1	205.7	213.4	194.8	202.9	174.4	192.0	163.2	182.2	229.5	203.9	187.6	2,397.6
1975	211.0	201.2	198.7	181.7	183.0	180.6	173.7	178.7	216.6	212.8	219.7	241.6	2,399.3
1976	265.1	259.6	225.8	198.8	190.5	199.8	197.4	195.1					
BUTTER:													
1970	99.8	92.5	107.0	111.2	116.9	113.3	92.1	78.7	71.9	81.6	79.0	93.1	1,137.0
1971	102.6	97.7	111.2	112.3	118.2	112.6	89.4	81.1	69.5	79.9	79.3	89.9	1,143.7
1972	99.9	99.9	106.9	108.0	117.9	110.0	87.7	75.0	66.4	75.2	73.5	81.6	1,101.9
1973	95.2	84.4	91.4	91.9	99.9	87.1	67.7	56.6	51.1	63.4	60.3	69.5	918.6
1974	83.0	71.4	76.8	90.3	102.2	95.2	80.8	70.4	63.9	70.7	67.3	89.6	961.7
1975	99.9	90.1	97.4	102.7	101.6	88.0	69.4	57.7	57.5	68.3	63.9	84.0	980.5
1976	94.3	85.4	89.3	87.6	94.0	84.0	72.4	66.0					
TOTAL 1/:													
1970	302.3	290.9	297.2	280.5	274.8	294.4	261.8	245.5	261.4	282.5	266.1	309.9	3,367.4
1971	315.5	286.7	307.1	293.2	294.6	298.5	252.9	254.4	264.1	268.1	289.5	309.3	3,433.9
1972	307.8	294.8	308.9	289.5	304.4	296.3	252.1	269.7	263.7	279.0	289.6	310.3	3,466.0
1973	327.8	276.1	290.1	276.3	300.2	255.6	219.5	244.3	236.9	287.6	278.5	284.6	3,277.6
1974	331.1	277.2	290.2	285.0	305.1	269.6	272.8	233.6	246.1	300.2	271.2	277.1	3,359.3
1975	310.9	291.2	296.1	284.4	284.6	268.6	243.1	236.5	274.1	281.1	283.6	325.6	3,379.8
1976	359.4	345.0	315.1	286.3	284.6	283.8	269.8	261.1					
	COOKING FATS												
LARD:													
1970	153.8	129.6	148.9	161.4	138.5	145.3	140.0	143.5	166.4	184.7	184.7	191.0	1,887.8
1971	176.6	138.6	203.4	171.0	154.0	166.0	142.0	150.0	156.0	148.0	168.0	162.0	1,935.6
1972	131.0	112.0	157.0	138.5	146.1	137.0	107.0	126.0	113.0	128.0	136.0	109.0	1,540.6
1973	116.0	96.0	113.0	100.0	120.0	110.0	87.0	86.0	84.0	111.0	113.0	100.0	1,236.0
1974	113.0	89.0	109.0	113.0	130.0	113.0	105.0	117.0	111.0	128.0	112.0	104.0	1,344.0
1975	103.0	87.0	94.0	96.0	86.0	74.0	68.0	67.0	75.0	78.0	83.0	84.0	995.0
1976	87.0	67.0	90.0	85.0	80.0	76.0	74.0	87.0					
SHORTENING:													
1970	295.0	302.2	314.5	303.1	294.6	293.8	256.9	308.2	298.2	316.5	305.6	299.0	3,587.8
1971	291.5	309.2	300.0	272.4	277.1	290.4	261.5	305.6	309.4	301.4	306.5	290.1	3,515.0
1972	294.9	304.5	318.1	293.7	307.8	306.9	272.6	332.4	312.8	348.0	334.3	305.1	3,731.1
1973	311.4	291.5	336.8	292.4	311.6	280.3	252.0	310.2	275.9	351.4	314.9	307.4	3,635.8
1974	346.4	312.6	327.7	301.0	286.2	280.7	304.3	306.4	298.5	350.9	315.9	272.2	3,702.8
1975	299.7	278.7	280.4	307.9	288.9	268.9	285.1	299.6	331.2	402.8	337.1	332.3	3,712.6
1976	331.2	307.6	364.5	327.6	310.7	324.0	316.1	336.9					
TOTAL 1/:													
1970	448.8	431.8	463.4	464.5	433.1	439.1	396.9	451.7	464.6	501.2	490.3	490.0	5,475.6
1971	468.1	447.8	503.4	443.4	431.1	456.4	403.5	455.6	465.4	449.4	474.5	452.1	5,450.6
1972	425.9	416.5	475.1	432.2	453.9	443.9	379.6	458.4	425.8	476.0	470.3	414.1	5,271.7
1973	427.4	387.5	449.8	392.4	431.6	390.3	339.0	396.2	359.9	462.4	427.9	407.4	4,871.8
1974	459.4	401.6	436.7	414.0	416.2	393.7	409.3	423.4	409.5	478.9	427.9	376.2	5,046.8
1975	402.7	365.7	374.4	403.9	374.9	342.9	353.1	366.6	406.2	480.8	420.1	416.3	4,707.6
1976	418.2	374.6	454.5	412.6	390.7	400.0	390.1	423.9					
	TOTAL SOLID FOOD FATS 1/												
1970	751.1	722.8	760.7	745.1	708.0	733.5	658.8	697.3	726.0	783.6	756.4	799.9	8,843.1
1971	783.6	734.5	810.4	736.7	725.6	754.9	656.4	710.0	729.5	717.5	764.0	761.4	8,884.5
1972	733.7	711.3	784.0	721.7	758.3	740.2	631.7	728.1	689.5	755.0	759.9	724.4	8,737.7
1973	755.2	663.6	739.9	668.7	731.8	645.9	558.5	640.5	596.8	750.0	706.4	692.0	8,149.4
1974	790.5	678.8	726.9	699.0	721.3	663.3	682.1	657.0	655.6	779.1	699.1	653.3	8,406.1
1975	713.6	656.9	670.5	688.3	659.4	611.5	596.1	603.0	680.4	761.9	703.7	741.9	8,087.3
1976	777.6	719.6	769.6	698.9	675.3	683.8	659.9	685.0					

1/ TOTALS MAY NOT ADD DUE TO ROUNDING.

TABLE 37--FATS AND OILS USED IN THE MANUFACTURE OF MARGARINE, BY MONTHS AND CALENDAR YEARS, 1970-76

YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL 1/
						MILLION POUNDS							
						SOYBEAN OIL							
1970	134.9	131.9	125.9	112.4	97.6	110.2	103.5	104.9	119.5	122.6	116.6	129.8	1,409.7
1971	128.9	112.8	119.9	107.9	107.8	113.9	99.2	105.2	116.7	114.9	127.7	130.5	1,385.3
1972	128.0	119.2	125.2	106.8	111.7	109.3	99.3	117.8	122.8	131.7	141.6	147.6	1,461.0
1973	145.5	116.7	123.7	115.6	126.9	104.5	96.5	119.5	120.8	142.8	141.0	137.7	1,491.2
1974	152.5	128.0	137.1	123.5	126.0	106.7	113.4	97.3	106.7	135.0	120.2	110.2	1,456.6
1975	129.9	123.7	126.1	119.9	124.4	122.0	115.5	114.8	144.6	140.3	146.2	160.5	1,567.8
1976	176.3	166.1	141.7	127.2	121.1	133.0	127.9	125.6					
						COTTONSEED OIL							
1970	6.0	6.5	5.9	4.5	4.9	6.3	4.5	5.1	5.4	6.7	5.3	6.4	67.5
1971	6.3	5.5	4.3	4.9	5.6	5.2	4.4	4.7	5.0	4.6	7.0	6.0	63.4
1972	5.7	4.7	5.6	5.8	5.6	5.1	4.1	5.5	5.3	5.9	6.0	5.9	65.2
1973	6.0	5.8	5.3	4.9	5.3	4.3	3.6	4.6	5.1	6.3	5.8	5.8	62.8
1974	6.5	5.2	6.3	5.0	4.8	4.0	4.4	3.5	4.3	6.1	4.4	3.4	57.9
1975	4.0	3.8	3.9	4.2	3.3	3.8	3.7	3.6	4.0	3.7	3.9	4.3	46.1
1976	5.6	4.5	4.9	3.1	3.2	4.1	3.7	3.9					
						CORN OIL							
1970	17.0	13.9	16.1	12.4	12.8	15.8	14.8	13.3	16.4	17.6	15.1	19.8	185.0
1971	17.8	14.3	15.3	16.7	13.3	14.1	14.0	13.8	16.3	14.5	17.4	18.3	185.9
1972	14.7	16.4	15.0	14.6	15.5	15.6	14.0	16.6	17.1	16.8	18.1	19.3	193.7
1973	18.9	17.7	17.8	16.0	16.0	16.4	13.7	18.4	17.5	21.6	19.8	19.6	213.4
1974	23.7	16.3	14.7	14.1	16.0	11.7	14.8	11.6	14.6	18.9	15.2	16.4	188.1
1975	17.4	14.2	16.9	12.4	13.4	14.9	13.8	15.3	16.3	16.5	17.6	19.7	188.4
1976	20.1	17.7	17.6	17.3	15.9	12.7	18.0	18.8					
						PALM OIL							
1970	---	---	---	---	---	---	---	---	---	.1	.1	.3	.6
1971	---	.1	.1	.1	.1	---	.1	.1	.1	.2	---	.2	1.0
1972	.2	---	---	.1	---	---	.2	.2	---	---	.4	.3	1.4
1973	.3	2.2	---	.8	.8	.9	---	.5	.2	.6	.5	---	6.9
1974	---	---	---	---	---	---	---	---	---	---	---	---	---
1975	---	---	1.1	1.2	---	1.2	1.8	5.7	5.1	5.7	4.8	5.0	31.5
1976	5.0	8.6	3.9	3.2	3.5	2.7	3.8	3.0					
						SAFFLOWER OIL							
1970	2.3	2.0	2.8	2.0	1.7	1.9	1.1	.9	1.5	1.5	2.0	2.3	21.8
1971	1.8	1.1	1.7	1.2	1.4	1.5	1.3	1.6	2.0	1.3	2.4	1.9	19.1
1972	.6	2.0	2.3	1.7	1.4	1.8	1.3	1.7	1.6	1.6	2.2	2.1	20.3
1973	2.4	3.2	3.9	3.6	2.6	1.5	1.5	2.2	3.1	3.5	2.6	1.8	31.8
1974	3.1	3.0	2.2	1.3	.8	1.2	.6	.8	.9	1.0	.7	.5	15.9
1975	.5	.6	.7	.4	.5	.2	.4	.2	.3	.4	1.2	1.8	7.4
1976	1.3	2.4	1.0	.5	.9	.3	.8	.4					
						ANIMAL FATS 2/							
1970	2.2	3.4	3.8	4.9	6.7	9.0	9.8	8.2	9.0	12.2	13.4	16.3	98.8
1971	16.0	15.9	15.6	11.4	11.1	13.5	11.8	12.5	14.4	15.0	14.6	16.7	168.3
1972	16.3	12.3	13.8	14.1	15.3	14.9	11.8	13.2	9.5	5.7	3.9	7.3	138.1
1973	12.2	8.6	7.1	7.1	9.9	7.5	6.3	4.0	2.1	3.1	5.2	6.1	79.1
1974	10.5	7.8	9.7	9.7	12.9	12.6	17.4	13.7	17.5	20.1	19.2	15.9	167.0
1975	15.7	11.9	7.2	4.6	3.8	2.0	1.6	.8	.7	.8	.6	1.9	51.4
1976	1.8	.8	1.3	1.8	2.7	1.9	3.2	2.0					
						ALL OTHER FATS AND OILS 3/							
1970	.9	1.7	1.4	1.0	1.0	1.1	1.0	.8	.9	.4	.2	---	10.5
1971	.6	.4	1.4	.6	.6	.8	.5	.6	.4	1.0	.6	.4	8.0
1972	---	.5	.7	.4	1.2	.5	.4	.4	.6	.8	.5	.3	6.3
1973	1.0	1.2	.9	---	---	.2	.6	.5	.3	.1	.2	.7	5.7
1974	1.0	1.2	.9	1.1	.4	2.4	2.0	2.8	1.5	1.7	1.0	2.5	18.5
1975	1.4	5.0	1.5	2.2	2.6	2.4	1.9	2.0	2.2	2.2	2.3	2.0	27.8
1976	1.3	6.4	9.4	6.5	5.8	2.8	1.1	2.3					
						TOTAL FATS AND OILS 1/							
1970	163.3	159.4	155.9	137.2	124.7	144.3	134.7	133.2	152.7	161.1	152.7	174.9	1,793.9
1971	171.4	150.1	158.3	142.8	139.9	149.0	131.3	138.5	154.9	151.5	169.7	174.0	1,831.0
1972	165.5	155.1	162.6	143.5	150.7	147.2	131.1	155.4	156.9	162.5	172.7	182.8	1,886.0
1973	186.3	155.4	158.7	148.0	161.5	135.3	122.2	149.7	149.1	178.0	175.1	171.7	1,890.9
1974	197.3	161.5	170.9	154.7	160.9	138.6	152.6	129.7	145.5	182.8	160.7	148.9	1,904.0
1975	168.9	159.2	157.4	144.9	148.0	146.5	138.7	142.4	173.2	169.6	176.6	195.2	1,920.4
1976	211.4	206.5	179.8	159.6	153.1	157.5	158.5	156.0					

1/ TOTALS MAY NOT ADD DUE TO ROUNDING. 2/ INCLUDES LARD AND BEEF FATS. 3/ MAINLY PEANUT AND COCONUT OILS.

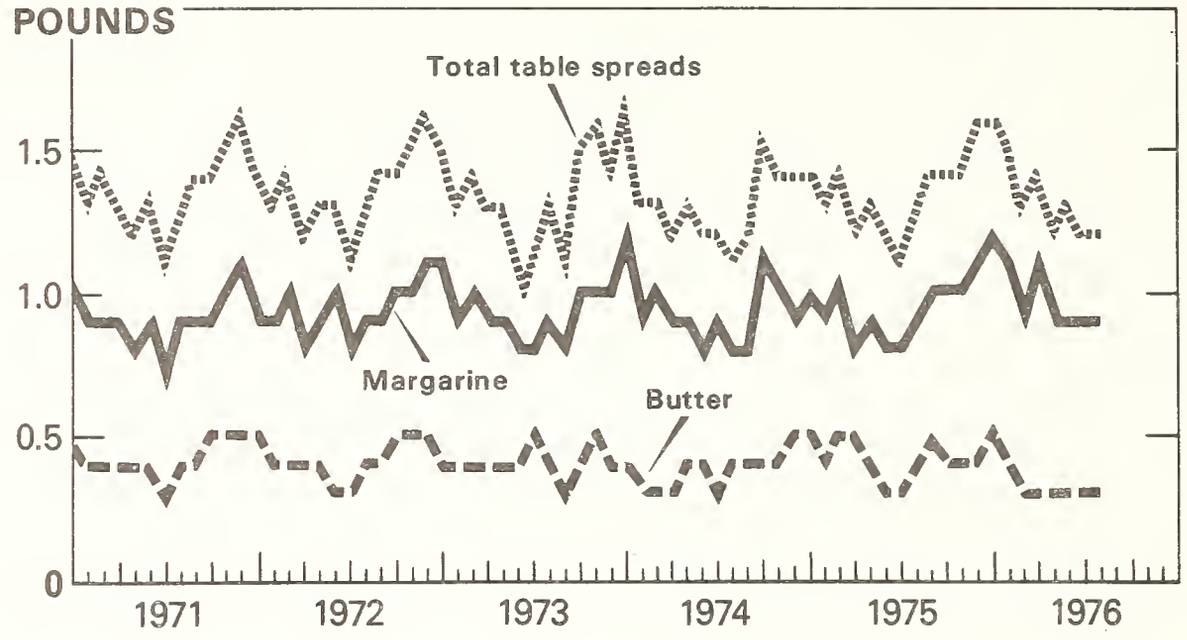
TABLE 38--U.S. DOMESTIC PER CAPITA DISAPPEARANCE OF SOLID FOOD FAT PRODUCTS, BY MONTHS AND CALENDAR YEARS, 1970-76

ITEM AND YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL 1/
						POUNDS							
						TABLE SPREADS (ACTUAL WEIGHT)							
MARGARINE:													
1970	1.0	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.9	1.0	0.9	1.1	10.9
1971	1.0	.9	.9	.9	.8	.9	.7	.9	.9	.9	1.0	1.1	10.9
1972	.9	.9	1.0	.8	.9	1.0	.8	.9	.9	1.0	1.0	1.1	11.2
1973	1.1	.9	1.0	.9	.9	.8	.8	.9	.8	1.0	1.0	1.0	11.2
1974	1.2	.9	1.0	.9	.9	.8	.9	.8	.8	1.1	1.0	.9	11.2
1975	1.0	.9	1.0	.8	.9	.8	.8	.9	1.0	1.0	1.0	1.1	11.2
1976	1.2	1.1	.9	1.1	.9	.9	.9	.9					
BUTTER:													
1970	.5	.4	.5	.4	.4	.4	.4	.4	.5	.5	.4	.5	5.4
1971	.5	.4	.4	.4	.4	.4	.3	.4	.4	.5	.5	.5	5.2
1972	.5	.4	.4	.4	.4	.3	.3	.4	.4	.5	.5	.5	5.0
1973	.4	.4	.4	.4	.4	.4	.5	.4	.3	.4	.5	.4	4.8
1974	.4	.3	.3	.3	.4	.4	.3	.4	.4	.4	.4	.5	4.6
1975	.5	.4	.5	.5	.4	.3	.3	.4	.5	.4	.4	.4	4.8
1976	.5	.4	.3	.3	.3	.3	.3	.3					
TOTAL 1/:													
1970	1.6	1.3	1.4	1.2	1.2	1.2	1.2	1.2	1.4	1.5	1.4	1.6	16.3
1971	1.5	1.3	1.4	1.3	1.2	1.3	1.1	1.3	1.4	1.4	1.5	1.6	16.1
1972	1.4	1.3	1.4	1.2	1.3	1.3	1.1	1.3	1.4	1.4	1.5	1.6	16.2
1973	1.5	1.3	1.4	1.3	1.3	1.1	1.1	1.3	1.1	1.5	1.6	1.4	16.0
1974	1.6	1.3	1.3	1.2	1.3	1.2	1.2	1.1	1.2	1.5	1.4	1.4	15.8
1975	1.4	1.3	1.4	1.2	1.3	1.2	1.1	1.3	1.4	1.4	1.4	1.6	16.0
1976	1.6	1.5	1.3	1.4	1.2	1.3	1.2	1.2					
						COOKING FATS							
LARD 2/:													
1970	.5	.3	.4	.5	.4	.4	.2	.3	.3	.4	.4	.4	4.6
1971	.5	.2	.5	.4	.2	.3	.4	.4	.4	.3	.3	.4	4.3
1972	.4	.2	.4	.3	.3	.3	.3	.4	.3	.4	.3	.4	3.8
1973	.2	.3	.3	.2	.3	.3	.3	.2	.3	.3	.3	.3	3.4
1974	.2	.2	.2	.3	.3	.2	.2	.3	.2	.3	.3	.3	3.2
1975	.3	.1	.3	.3	.3	.2	.2	.2	.2	.3	.3	.2	3.0
1976	.3	.2	.3	.2	.2	.2	.2	.3					
SHORTENING:													
1970	1.5	1.5	1.5	1.3	1.5	1.3	1.3	1.5	1.5	1.6	1.5	1.4	17.4
1971	1.4	1.5	1.4	1.3	1.4	1.3	1.4	1.4	1.5	1.4	1.5	1.3	16.9
1972	1.4	1.5	1.5	1.4	1.5	1.4	1.4	1.6	1.5	1.7	1.5	1.4	17.7
1973	1.4	1.4	1.6	1.3	1.5	1.2	1.4	1.5	1.3	1.6	1.4	1.4	17.2
1974	1.7	1.4	1.4	1.3	1.5	1.3	1.5	1.4	1.4	1.6	1.4	1.2	17.1
1975	1.4	1.3	1.3	1.4	1.4	1.2	1.4	1.4	1.5	1.8	1.5	1.4	17.2
1976	1.6	1.4	1.7	1.4	1.4	1.5	1.4	1.6					
TOTAL 1/:													
1970	2.0	1.8	1.9	1.8	1.8	1.7	1.5	1.9	1.8	2.0	1.9	1.8	22.0
1971	1.9	1.7	1.9	1.7	1.6	1.7	1.8	1.8	1.9	1.7	1.8	1.7	21.2
1972	1.8	1.7	1.9	1.6	1.7	1.7	1.7	2.0	1.8	2.0	1.8	1.8	21.5
1973	1.7	1.7	1.9	1.6	1.9	1.5	1.6	1.8	1.5	1.9	1.7	1.7	20.6
1974	1.9	1.6	1.6	1.7	1.8	1.5	1.7	1.8	1.7	1.9	1.7	1.5	20.3
1975	1.7	1.5	1.6	1.7	1.6	1.4	1.6	1.7	1.7	2.1	1.8	1.7	20.2
1976	1.8	1.6	2.0	1.6	1.6	1.7	1.7	1.8					
						TOTAL SOLID FOOD FATS 1/							
1970	3.6	3.1	3.3	3.1	3.0	2.9	2.7	3.1	3.3	3.5	3.3	3.4	38.3
1971	3.4	3.0	3.3	3.0	2.8	3.0	2.8	3.0	3.3	3.1	3.3	3.3	37.3
1972	3.2	2.9	3.3	2.9	3.0	3.0	2.8	3.3	3.1	3.5	3.3	3.4	37.7
1973	3.1	3.0	3.3	2.8	3.2	2.7	2.7	3.1	2.7	3.4	3.3	3.1	36.6
1974	3.5	2.9	2.9	2.9	3.1	2.7	2.9	2.9	2.9	3.4	3.1	2.8	36.1
1975	3.1	2.8	3.0	2.9	2.9	2.6	2.7	2.9	3.1	3.4	3.1	3.2	36.2
1976	3.5	3.0	3.3	3.0	2.8	2.9	2.9	3.0					

1/ TOTALS MAY NOT ADD DUE TO ROUNDING. 2/ DIRECT USE OF LARD.

U.S. CONSUMPTION OF TABLE SPREADS PER PERSON*

By Months



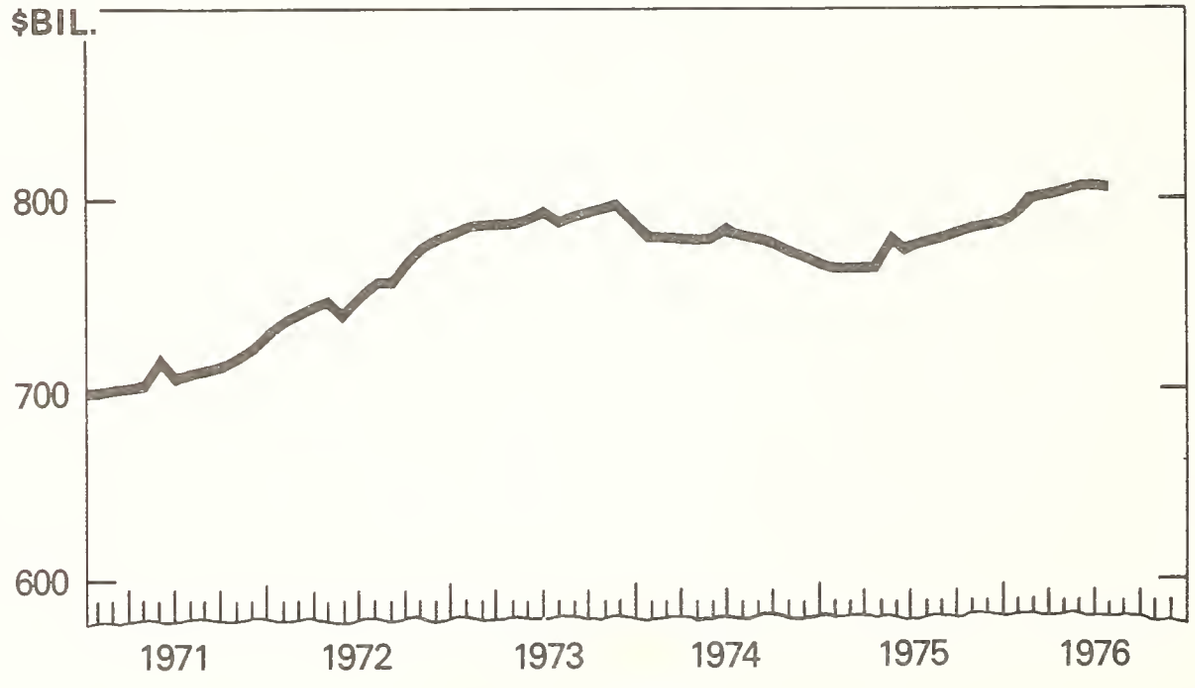
**PRODUCT WEIGHT.*

USDA

NEG. ERS 2641-76 (12)

U.S. REAL PERSONAL INCOME*

By Months



USDA

*DEFLATED BY THE CONSUMER PRICE INDEX, ALL ITEMS, 1967=100

NEG. ERS 2640-76 (12)

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